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January 15, 1980

U.S. DEPARTMENT OF COMMERCE

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OFFICIAL GAZETTE of the
UNITED STATES PATENT and TRADEMARK OFFICE

January 15, 1980 Volume 990 Number 3

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PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning the PCT, including the amounts of the fees thereunder and the States that may be designated in international applications, consult the notice entitled "Update of information concerning the Patent Cooperation Treaty" appearing in the OFFICIAL GAZETTE of July 3, 1979.

Effective August 1, 1979 the international fees are increased to the following amounts:

Basic fee under PCT Rule 15.1(i) for an international application containing 30 sheets or less	$190.00
Supplemental fee to the Basic fee for each page of an international application in excess of 30 sheets	3.50
Designation fee under PCT Rule 15.1(ii)	45.00

July 3, 1979.

LUTRELLE F. PARKER,
Acting Commissioner of Patents and Trademarks.

National Inventors' Day

The Patent and Trademark Office, along with the National Council of Patent Law Associations, will co-sponsor National Inventors Day in the Public Search Room on Saturday, February 9, 1980 from 1:00 p.m. to 5:00 p.m. and Sunday, February 10, 1980 from 10:00 a.m. to 5:00 p.m. The public is invited to view the exhibits on these days and to attend the ceremony at 2:00 p.m. on Sunday, February 10, 1980, during which four inventors will be inducted into the National Inventors Hall of Fame.

In order to assemble the exhibits it will be necessary to close the Search Room on Friday, February 8, 1980 at 5:00 p.m. We would appreciate the cooperation of all users of the Search facilities by removing all personal property and items for the early closing.

Nov. 27, 1979.

LUTRELLE F. PARKER,
Acting Commissioner of Patents and Trademarks.

Closing of Patent and Trademark Office on December 24, 1979

In view of the provisions of Executive Order 12179, issued on December 11, 1979, which closes all executive departments and agencies and excuses their employees from duty on Monday, December 24, 1979, that day constitutes "a holiday within the District of Columbia" under the provisions of 35 U.S.C. 21. Any action due in the Patent and Trademark Office on December 24, 1979, is to be considered timely if taken on December 26, 1979.

December 18, 1979.

SIDNEY A. DIAMOND,
Commissioner of Patents and Trademarks.

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

3,873,303, Re. S.N. 075,368, Filed Sep. 14, 1979, Cl. 71/118, HERBICIDAL USE AND COMPOSITIONS OF HALOPHENOXY BENZAMIDES, Robert J. Theissen, Owner of Record: *Mobil Oil Corporation, New York, N.Y.,* Attorney or Agent: Charles A. Huggett, Ex. Gp.: 122

4,051,540, Re. S.N. 79,171, Filed Sep. 26, 1979, Cl. 360/72.3, INSTRUCTION INDICATING APPARATUS FOR A RECORD AND/OR PLAYBACK DEVICE, Leslie N. Wilder, et al., Owner of Record: *Dictaphone Corporation, Rye, N.Y.,* Attorney or Agent: Arthur V. Smith, Ex. Gp.: 235

PATENT NOTICES

Certificates of Correction for the Week of Jan. 15, 1980

D. 252,087	4,108,991	4,163,028	4,169,848
D. 252,570	4,111,856	4,163,092	4,170,012
D. 253,175	4,118,394	4,164,410	4,170,053
D. 253,176	4,132,284	4,164,431	4,170,075
3,962,206	4,134,724	4,165,240	4,170,132
3,972,682	4,136,280	4,165,321	4,170,266
4,027,512	4,140,396	4,165,328	4,170,446
4,059,249	4,141,472	4,165,377	4,171,044
4,059,381	4,143,656	4,165,949	4,171,250
4,062,801	4,151,321	4,166,723	4,171,286
4,062,917	4,151,660	4,166,798	4,171,325
4,064,927	4,152,325	4,167,587	4,171,847
4,072,052	4,152,354	4,167,606	4,171,425
4,073,182	4,152,432	4,167,738	4,171,634
4,076,281	4,157,687	4,168,215	4,171,854
4,082,940	4,157,780	4,168,368	4,171,953
4,092,366	4,158,024	4,169,306	4,172,019
4,094,643	4,158,064	4,169,626	4,172,074
4,094,967	4,158,676	4,169,636	4,172,199
4,098,899	4,160,817	4,169,663	4,172,296
4,100,720	4,161,866	4,169,721	4,172,830
4,100,757	4,161,575	4,169,834	4,173,280

Errata

In the notice of Reissue Applications Filed, which appears in the OFFICIAL GAZETTE of March 27, 1979, the listing of Patent No. 3,918,676 on page 28 of the Patent Section, 980 OG 28, and page 18 of the Trademark Section, 980 TMOG 18, is in error and should be disregarded. The correct entry is as follows:

3,918,646, Re. S.N. 004,632, Filed January 19, 1979, Cl. 239/271, IRRIGATION SYSTEMS BY TRICKLING, Jaime Leal-Dias, et al., Owner of Record: *Inventors*, Attorney or Agent: Bertram I. Rowland, et al., Ex. Gr.: 313.

In the notice of Reissue Applications Filed, which appears in the OFFICIAL GAZETTE of May 29, 1979, the entry for Patent No. 4,081,961, on page 37 of the Patent Section, 982 OG 37, and page 27 of the Trademark Section, 982 TMOG 27, is incorrect and should be disregarded. The correct entry is as follows:

4,081,961, Re. S.N. 015,513, Filed February 26, 1979, Cl. 60/386, ARTICULATED VEHICLE STEERING SYSTEM, Robert M. Dwyer, Owner of Record: *Massey-Ferguson Inc.*, Detroit, Mich., Attorney or Agent: John C. Thompson, Ex. Gr.: 341.

Office of the Secretary

PATENT AND TRADEMARK OFFICE ADVISORY COMMITTEE; RENEWAL

In accordance with the provisions of the Federal Advisory Committee Act, 5 U.S.C. App. (1976) and Office of Management and Budget Circular A-63 of March 1974, and after consultation with GSA, it has been determined that the renewal of the Patent and Trademark Office Advisory Committee is in the public interest in connection with the performance of duties imposed on the Department by law.

The Committee was first established in December 1975 (40 FR 54600, November 25, 1975), and was renewed in 1977 (42 FR 62174, December 9, 1977). Its present charter will expire on December 5, 1979. Its purpose is to continually advise the Patent and Trademark Office on matters concerning the patent system and the administration of the Office. The Committee has been successful in achieving this objective. Its recommendations have aided the Office, and have meaningfully contributed to the strengthening of the patent system.

In renewing the Committee, it has been determined that the original objective of advising the Commissioner on patent related matters is important and worth continuing. The patent system has a significant impact on the development of new technology and thereby on the domestic and international economies. The Commerce Department and the Patent and Trademark Office are continually faced with a broad range of policy questions as a result of pending patent legislation, patent treaties, court decisions, and other possibilities for change. Expert advice is needed from the private sector on patents, and neither the Department nor the Office have any other advisory committee that can perform this function.

The makeup of the Committee will continue with a balance representation of at least 8 but no more than 15 members drawn from independent and corporate inventors, patent attorneys, corporate executives, corporate research directors, members of the judiciary, consumer representatives, economists, journalists, and educators, appointed by the Secretary of Commerce.

Copies of the Committee's revised charter will be filed with appropriate committees of the Congress.

Inquiries or comments may be addressed to the Committee Control Officer Herbert C. Wamsley, U.S. Patent and Trademark Office, Washington, D.C. 20231, telephone: 703-557-3071.

GUY W. CHAMBERLAIN, JR.
Dated December 7, 1979. *Assistant Secretary for Administration.*

[FR Doc. 79-38217 Filed 12-12-79; 8:45 am]

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The libraries listed herein, designated as patent depository libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent months or years in some libraries to all or most of the patents issued since 1870, or earlier, in other libraries.

These patent collections are open to public use and each of the patent depository libraries, in addition, offers the publications of the patent classification system (e.g. The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the table following, the collections are organized in patent number sequence.

Depending upon the library, the patents may be available in microfilm, in bound volumes of paper copies, or in some combination of both. Facilities for making paper copies from either microfilm in reader-printers or from the bound volumes in paper-to-paper copies are generally provided for a fee.

Owing to variations in the scope of patent collections among the patent depository libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

State	*Name of Library*	*Telephone Contact*
Alabama	Birmingham Public Library	(205) 254-2555
California	Los Angeles Public Library	(213) 626-7555 Ext. 274
	Sunnyvale Patent Library*	(408) 736-0795
Colorado	Denver Public Library	(303) 573-5152 Ext. 223
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4519
Illinois	Chicago Public Library	(312) 269-2814
Massachusetts	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Detroit Public Library	(313) 833-1458
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 214
Nebraska	Lincoln: University of Nebraska-Lincoln, Love Library	(404) 472-3411
New Jersey	Newark Public Library	(201) 733-7740
New York	Albany: New York State Library	(518) 474-5125
	Buffalo and Erie County Public Library	(716) 856-7525 Ext. 267
	New York Public Library (The Research Libraries)	(212) 790-6291
North Carolina	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
Ohio	Cincinnati & Hamilton County Public Library	(513) 369-6969
	Cleveland Public Library	(216) 623-2932
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 242-7361 Ext. 258
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Pennsylvania	Philadelphia: Franklin Institute Library	(215) 448-1226
	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3128
Rhode Island	Providence Public Library	(401) 521-7722 Ext. 224
Texas	Dallas Public Library	(214) 748-9071
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Engineering Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3043

*Collection organized by subject matter.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF DECEMBER 1, 1979

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—R. FRIEDMAN, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metallurgical Apparatus; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	5-1-79
GENERAL ORGANIC CHEMISTRY, GROUP 120—C. E. VAN HORN, Director. Heterocyclic Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines: Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	10-3-78
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—J. O. THOMAS, JR. Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, Treating Processes, and Apparatus Therefor; Irradiation (Part); Bleaching; Dyeing; Leather, Fur and Textile Treating Compositions.	2-8-79
COATING, LAMINATING AND PHOTOGRAPHY, GROUP 160—S. N. ZAHARNA, Director. Coating; Processes, Apparatus and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; and Photography.	4-4-79
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—R. F. WHITE, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	10-10-78
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Horology; Acoustics; Recorders; Weighing Scales.	4-13-78
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director. Ordnance, Firearms and Ammunition; Lubrication; Illumination; Nuclear and Reactors; Radar; Directional Radio; Torpedoes; Seismic Exploring; Cathode Ray Tube Circuitry; Cryptograph; Laser Devices; Radioactive Materials; Power Metallurgy, Rocket Fuels.	5-19-78
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—N. ANSHER, Director. Communications; Multiplexing Techniques; Television; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	10-2-78
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—A. L. SMITH, Director. Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	8-31-78
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	9-1-78
DESIGNS, GROUP 290—C. D. QUARFORTH, Director. Industrial Arts; Household, Personal and Fine Arts.	1-9-78
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—M. M. NEWMAN, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	11-1-78
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—S. S. MATTHEWS, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion-Bonding, Metal Founding; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks; Fishing, Etc.; Butchering; and Books and Printed Matter.	11-1-78
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—B. R. GRAY, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Plants; Harvesting; Earth Working and Excavating; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Information Dissemination.	11-21-78
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—D. J. STOCKING, Director. Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	5-4-78
GENERAL CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—G. M. FORLENZA, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Textiles; Apparel and Shoes; Sewing Machines; Machine Elements; Clutches.	2-20-78

Expiration of patents: The patents within the range of numbers indicated below expire during December 1979, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 3,066,302 to 3,070,800, inclusive
Plant Patents..... Numbers 2,198 to 2,207, inclusive

REISSUES

JANUARY 15, 1980

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 30,188

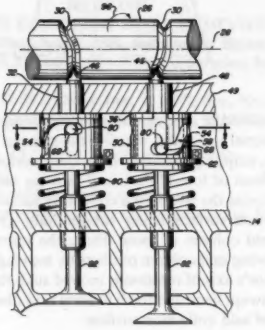
VALVE TRAIN FOR INTERNAL COMBUSTION ENGINE

Wilfred F. Predhome, Jr., 487 Ursula St., Aurora, Colo. 80011

Original No. 4,061,115, dated Dec. 6, 1977, Ser. No. 691,429, Jun. 1, 1976. Application for reissue Mar. 22, 1978, Ser. No. 889,145

Int. Cl.[2] F01L *1/34*

U.S. Cl. 123—90.16 11 Claims



10. A valve train for a poppet valve of a reciprocating piston engine comprising:

a piston engine;

a cam shaft having an axis of rotation and being mounted on said engine for rotation about its axis at angular velocities which are a function of engine rpm;

means forming a cam surface on said shaft;

a cam follower having an axis of rotation;

means for mounting said cam follower on said engine in engagement with the cam surface of said cam shaft to convert rotation of said cam shaft into reciprocating rotation of said cam follower about its axis of rotation;

a reciprocating member having projecting means;

cam means operatively connected to said cam follower;

movable control means concentrically mounted with respect to said cam means;

said cam means, control means and projecting means interacting to convert reciprocal rotation of said cam follower to reciprocating linear motion of the reciprocating member substantially along the axis of rotation of said cam follower;

said cam means and control means varying the timing of said reciprocating member with respect to the angular position of the cam shaft as a function of the position of said control means with respect to said engine;

means operatively connected to the control means to vary the control means position to vary the timing of the reciprocating member;

a poppet valve; and

means for operatively connecting said valve to said reciprocating member.

Re. 30,189

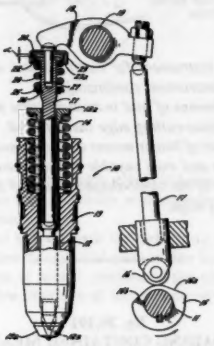
FUEL INJECTION SYSTEM FOR DIESEL ENGINES

Julius P. Perr, Columbus, Ind., assignor to Cummins Engine Company, Columbus, Ind.

Original No. 3,965,875, dated Jun. 29, 1976, Ser. No. 375,350, Jul. 2, 1973. Application for reissue Nov. 17, 1977, Ser. No. 852,281

Int. Cl.[2] F02M *39/00*

U.S. Cl. 123—139 AY 11 Claims



1. A fuel injection system for a diesel engine, said system comprising an injection train connected between the camshaft of the engine and the plunger of a fuel injector for operating said plunger in synchronism with the rotation of said camshaft, *said fuel injector having a single nozzle that is continuously open during metering of the fuel with a fixed open area and* said injection train having a predetermined spring rate, auxiliary spring means connected in series with said injection train and having a spring rate substantially different from that of said injection train for advancing said plunger at a first rate determined by the spring rate of said auxiliary spring means in response to a predetermined reaction force on the tip of said plunger, and means *acting in parallel with said auxiliary spring means* for [rendering] *bypassing* said auxiliary spring means [ineffective] in response to a predetermined deflection thereof so that said plunger is thereafter advanced at a second rate determined by the spring rate of said injection train.

Re. 30,190

ELECTRICALLY HEATED SURGICAL CUTTING INSTRUMENT

Robert F. Shaw, 135 Willow Brook Dr., Portola Valley, Calif. 94025

Original No. 3,826,263, dated Jul. 30, 1974, Ser. No. 278,684, Aug. 7, 1972. Division of Ser. No. 63,645, Aug. 13, 1970, abandoned, which is a continuation of Ser. No. 681,737, Nov. 9, 1967, abandoned. Application for reissue Feb. 9, 1976, Ser. No. 656,730

681,737, Nov. 9, 1967, abandoned. Application for reissue Feb. 9, 1976, Ser. No. 656,730

Int. Cl.[2] A61B *17/38;* A61N *3/00*

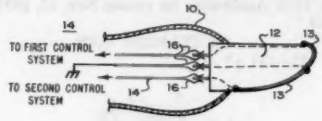
U.S. Cl. 128—303.1 19 Claims

1. A surgical instrument for cutting tissue with simultaneous hemostasis, the instrument comprising:

a blade [shaped support wafer of electrically insulating material] having [disposed thereon] an electrically heatable element of electrically conductive material having a resistance which varies as a function of the temperature thereof, the element including a plurality of sections

which form segments or portions [of a] *disposed in the region along the* tissue cutting edge of said [support wafer] *blade*, each of said sections conducting electrical current [along said edge] for [directly] heating *segments along said* edge; and

connection means *for* providing electrical connections to each of said sections for independently supplying electrical power thereto for maintaining the resistance of each of said sections at a substantially constant selected value.



4. A surgical instrument for cutting tissue with simultaneous hemostasis, the instrument comprising:

blade-shaped means of said instrument that has an edge which forms the tissue-cutting edge thereof; and

a plural number of heater means each disposed along the tissue-cutting edge and each capable of being heated to elevate the temperature of the blade-shaped means in said regions of the tissue-cutting edge.

Re. 30,191

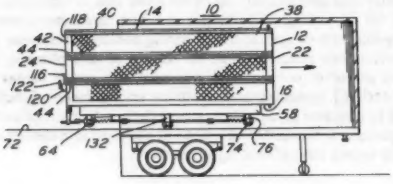
LOADING CONTAINER MEANS

Frances E. Mautz, 7922 Fairfield St., Philadelphia, Pa. 19154

Original No. 3,917,304, dated Nov. 4, 1975, Ser. No. 426,943, Dec. 20, 1973. Division of Ser. No. 175,439, Aug. 27, 1971, Pat. No. 3,784,054. Application for reissue Oct. 11, 1977, Ser. No. 840,662

Int. Cl.² B62D *21/18*

U.S. Cl. 280—43.23 **13 Claims**



1. A loading container means comprising a body having horizontal top and bottom walls and vertical side walls providing a storage chamber therein, at least one of said walls providing an opening to said chamber of said body, a plurality of wheel units secured with respect to the bottom wall of said body for movably supporting said body over a supporting surface, said wheel units providing a wheel element movable between a retracted position and an extended position, means for actuating the wheel elements between their retracted and extended positions including pneumatic means, said wheel elements including an arm pivoted at one end and supporting a swivel mounted wheel at the other end, said pneumatic means including a pneumatic cylinder secured at one end with the bottom wall of said body and having its other end pivotally attached to said arm for moving said arm from a retracted position proximate the bottom wall of said body to an extended position away from said bottom wall, and lock means for releasably securing said arm in its extended terminal position substantially perpendicular to the bottom wall of said body.

Re. 30,192

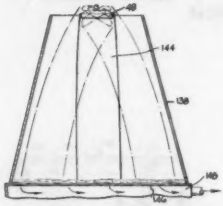
METHOD AND APPARATUS FOR MAKING GLASS FIBERS UTILIZING AN OSCILLATING SPINNER

Duane H. Faulkner, Cambridge City; Steven D. Sanford, and Herbert M. Stanley, both of Richmond, all of Ind., assignors to Johns-Manville Corporation, Denver, Colo.

Original No. 3,997,307, dated Dec. 14, 1976, Ser. No. 599,614, Jul. 28, 1975. Application for reissue Aug. 24, 1978, Ser. No. 936,674

Int. Cl.² C03B *37/04*

U.S. Cl. 65—6 **23 Claims**



1. In a method of making a fibrous mat comprising feeding a molten material to a rotor, rotating the rotor at a high speed to form fibers, stripping the fibers from the exterior of the rotor to form a column of loose fibers, and moving said column back and forth across the width of a collection surface, the width of said collection surface being substantially greater than the width of said column of loose fibers; the improvement comprising: moving said column of fibers by moving the rotor such that the rotor's axis of rotation is moved such that said column of fibers is swept back and forth to form said fibrous mat across the width of said collection surface.

Re. 30,193

FIRE RETARDANT AGENT

James D. O'Shaughnessy, Gouverneur, N.Y.

Original No. 3,897,387, dated Jul. 29, 1975, Ser. No. 363,212, May 23, 1973. Application for reissue Feb. 11, 1976, Ser. No. 657,321

Int. Cl.² C08C *11/04*

U.S. Cl. 260—45.7 R **38 Claims**

1. A fire retardant agent comprising a calcium [or magnesium] mineral borate or a calcium [or magnesium] metaborate and a halogen source, said halogen having an atomic weight greater than 19.

Re. 30,194

HIGH FREQUENCY COAXIAL CABLE

Saverio T. Bruno, Danbury, and Norbert J. Sladek, Fairfield, both of Conn., assignors to Bunker Ramo Corporation, Oak Brook, Ill.

Original No. 3,912,850, dated Oct. 14, 1975, Ser. No. 402,096, Oct. 1, 1973. Application for reissue Oct. 11, 1977, Ser. No. 844,323

Int. Cl.² H01B *11/18*

U.S. Cl. 174—28 **10 Claims**

9. A high frequency coaxial cable, comprising:

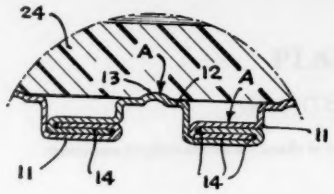
an outer conductor with spaced interior convolutions presenting inner surfaces;

at least one inner conductor disposed axially within said outer conductor;

a dielectric member around said inner conductor and extending to said outer conductor; and

at least one inwardly extending detent spaced along said inner surfaces of said outer conductor in compressive engagement

with said dielectric member to lock said member in a desired position with the position of said detent selected in accordance



with a desired electrical characteristic of said cable to control said electrical characteristic.

Re. 30,195

GUIDED BEAM FLAT DISPLAY DEVICE

Charles H. Anderson, Rocky Hill, and Stanley Bloom, Bridgewater, both of N.J., assignors to RCA Corporation, New York, N.Y.

Original No. 4,028,582, dated Jun. 7, 1977, Ser. No. 615,353, Sep. 22, 1975. Application for reissue Dec. 19, 1977, Ser. No. 862,188

Int. Cl.[2] **H01J** *29/08, 29/72, 31/00*

U.S. Cl. 313—422 **17 Claims**

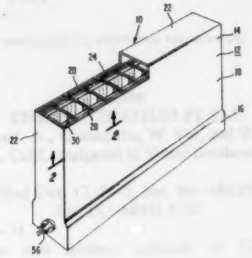
1. An electron display device comprising

an evacuated envelope having a substantially flat front wall,

a phosphor screen along the inner surface of said front wall, *said screen comprising a plurality of picture elements,*

means in said device for generating a beam of electrons and directing said beam in a first path generally parallel to and across said phosphor screen,

means along said first beam path for selectively deflecting said beam out of said first path at selected points along said



first path into a second path extending toward said phosphor screen so that the beam will impinge on said phosphor screen, and

means along said second path for deflecting said beam in a plane transverse to said first path of the beam so that the beam will scan at least a portion of the phosphor screen *comprising more than one of said picture elements.*

PLANT PATENTS

GRANTED JANUARY 15, 1980

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

4,493

ROSE PLANT

Gijsbert de Ruiter, Hazerswoude, Netherlands, assignor to Jackson & Perkins Company, Medford, Oreg.

Filed Sep. 8, 1978, Ser. No. 940,855
Int. Cl.[2] A01H *5/00*
U.S. Cl. Plt.—8 **1 Claim**

1. A new and distinct variety of rose of the miniature class, substantially as herein illustrated and described, characterized particularly as to novelty by the unique combination of its vigorous well-branched habit of growth, its long oval leaflets which are resistant to rose powdery mildew, its abundant continuous production of light yellow buds which age to white and are nearly scentless.

4,494

CHRYSANTHEMUM PLANT

Walter H. Jessel, Jr., Grantsville, W. Va., and William E. Duffett, Salinas, Calif., assignors to Yoder Brothers, Inc., Barberton, Ohio

Filed Oct. 17, 1978, Ser. No. 952,259
Int. Cl.[2] A01H *5/00*
U.S. Cl. Plt.—74 **1 Claim**

1. A new and distinct cultivar of *Chrysanthemum morifolium,* Ramat., plant known by the cultivar name Moonwind and particularly characterized as to uniqueness by the combined characteristics of flat capitulum form; spooned daisy capitulum type; white ray floret color, devoid of pink discoloration; diameter across face of capitulum ranging from 65 to 75 mm. at maturity; uniform eight week photoperiodic flowering response to short days; medium plant height when grown as a pinched spray pot; semi-spreading branching pattern; and minimum pollen production.

PATENTS

GRANTED JAN. 15, 1980

ERRATA

For CLASS	See PATENT NO.
321–009	4,183,139
224–273	4,183,452
316–030	4,183,595
430–069	4,183,747
430–135	4,183,748
430–211	4,183,749
430–264	4,183,750
430–258	4,183,751
430–382	4,183,752
430–017	4,183,753
430–223	4,183,754
430–213	4,183,755
430–569	4,183,756
435–116	4,183,786
435–043	4,183,787
430–278	4,183,788
430–115	4,183,818
548–195	4,183,854
548–246	4,183,856
549–072	4,183,859
525–100	4,183,874
525–006	4,183,875
525–232	4,183,876
525–070	4,183,877
525–086	4,183,878
424–063	4,183,898
426–036	4,183,911
429–193	4,183,988
525–248	4,184,030
430–151	4,184,060
433–029	4,184,196
363–141	4,184,211

PATENTS

GRANTED JAN. 25, 1910

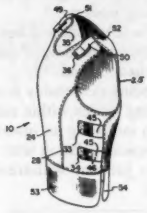
INDEX

PATENTS

GRANTED JANUARY 15, 1980

GENERAL AND MECHANICAL

4,183,097
BODY ARMOR FOR WOMEN
Sirvart A. Mellian, Watertown, Mass., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.
Filed Aug. 10, 1978, Ser. No. 932,729
Int. Cl.[2] F41H *1/02*
U.S. Cl. 2—2.5 **6 Claims**

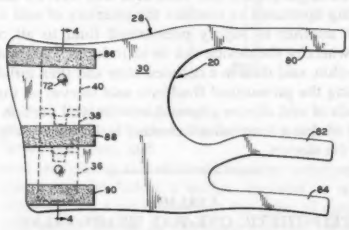


1. A contoured, all-fabric, body armor garment for the protection of the torso of a woman against small arms missiles and spall which comprises:

a. a contoured front protective armor panel composed of a plurality of superposed layers of ballistically protective plies, each layer comprising from two to five plies of woven fabric made of aramid polymer yarns, said aramid polymer yarns having a denier of about 1000, said front protective armor panel comprising a center section and two side sections each relatively narrower than said center section, one of said side sections being joined to said center section along one side thereof by means of an overlapping seam in which said one side section overlaps said center section at least one inch, the other of said side sections being joined to said center section along the other side thereof by means of an overlapping seam in which said other side section overlaps said center section at least one inch, both of said overlapping seams having the plies thereof stitched together approximately midway from side to side thereof; and

b. means for supporting said front protective armor panel on the torso of a woman wearer thereof.

4,183,098
WRIST SUPPORT APPARATUS
Miles V. Knowles, Jr., R.R. #1, Roanoke, Ind. 46783
Filed May 17, 1978, Ser. No. 907,145
Int. Cl.[2] A63B *71/14*
U.S. Cl. 2—16 **6 Claims**



1. Wrist support apparatus comprising:

a first substantially rigid elongated plate having first and second ends;

a substantially rigid link having first and second ends, the first end of said link being in hinged relation to said first end of said first plate to swing toward and away from said first plate within a predetermined included first arc between one side of said plate and one side of said link;

first means for providing a rigid first limit to the swinging action between said first plate and said link to prevent the swinging of said first plate from said one side of said link beyond said first limit, said predetermined arc being defined by said link and said first plate when positioned at said limit;

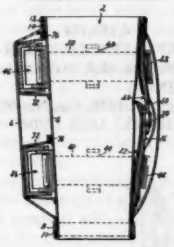
a second substantially elongated plate having first and second ends, said second end of said second plate being in hinged relation to the second end of said link to swing towards and away from said link within a predetermined included second arc from one side of said second plate and said one side of said link;

second means for providing a rigid second limit between said second plate and said link to prevent the swinging of said second plate from said one side of said link beyond said second limit, said predetermined second arc defined by said link and said second plate when positioned at said second limit;

third means for retaining said first and second plates and link in end to end adjoining hinged relation;

fourth means for releasably holding said plates, link, and third means in supporting relation to the forearm, wrist and hand of the user.

4,183,099
ATHLETIC KNEE PROTECTION DEVICE
Richard J. Lacey, T-161, Lake Lotawana, Lee's Summit, Mo. 64063
Filed Aug. 31, 1978, Ser. No. 938,635
Int. Cl.[2] A41D *13/06*
U.S. Cl. 2—24 **8 Claims**



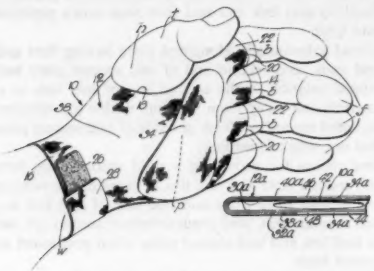
1. An athletic knee protection device compirising:

a. an elongated reinforcing bar consisting of two rigid sections pivotally joined at their contiguous ends, said bar being adapted to be extended along a wearer's leg at the inner side thereof, with the axis of the pivotal connection of said bar sections coaxial with the lateral axis of the knee joint, the surface of said bar adjacent the leg having a special configuration operable to engage over and be positioned by the wearer's flesh and underlying bone structure, when said bar is pressed firmly against the leg, said special configuration including a generally spherical socket configuration formed in the inner surface on one of said bar section in generally coaxial relation to the pivotal connection of said bar sections, whereby to engage over and be positioned accurately relative to the leg by the knob of bone underlying the flesh of the leg at the knee joint thereof, and

b. a pair of straps adapted to encircle the leg of the wearer,

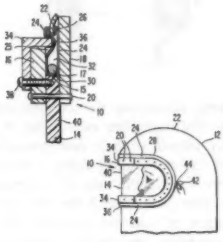
and said reinforcing bar, respectively above and below the knee joint and the pivotal connection of said bar sections, and operable to press said reinforcing bar firmly against the wearer's leg.

4,183,100
SPECIALTY GLOVE
Alexander H. De Marco, 85 Maple Ave., Shelton, Conn. 06484
Filed Dec. 20, 1978, Ser. No. 972,054
Int. Cl.[2] A41D *19/00*
U.S. Cl. 2—159 **2 Claims**



1. A specialty glove, providing a longitudinal sheath formed of laminated inner and outer plies of knitted and woven fabrics, respectively, said sheath being closed on all sides and at one end and open at the other end, and adapted for slip, with its open end leading, onto the palm part of a hand in fit therewith, said sheath also having in one of said sides and in said closed end first and second apertures through which to pass the thumb and fingers, respectively, of a hand on the slip of said sheath onto the palm part thereof so that the thumb and fingers of a wearer's hand are exposed, and said outer ply having a cut-out window through which is exposed a part of said inner ply in cover relation with a wearer's palm, with said exposed inner ply part being coated with a friction material for good gripping performance.

4,183,101
REPLACEABLE VISOR
Clarence Melander, Newark, Del., assignor to East Wind Industries, Inc., Dover, Del.
Filed May 19, 1978, Ser. No. 907,480
Int. Cl.[2] A62B *17/04*
U.S. Cl. 2—424 **11 Claims**



1. A replaceable visor, being particularly usable with a protective garment, which comprises:

(a) a transparent member held in place by the protective garment approximately in front of the eyes of the wearer;

(b) an inner frame member being fixedly secured to the inwardly facing edge of said transparent member and extending laterally outward peripherally therefrom;

(c) an outer frame member having fixedly secured to the outwardly facing edge of said transparent member and extending laterally outward peripherally therefrom to define a retaining channel in cooperation with said inner frame member circumferentially around the outer edge of said transparent member; and

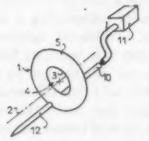
(d) beading means being fixedly secured to the protective garment and adapted to be retained within said retaining channel to hold the protective garment peripherally adjacent to the replaceable visor, said beading means including:

(1) a binding tape extending longitudinally around the edge of the protective garment around said transparent member and secured therealong at opposite lateral sides to opposite sides of the edges of the protective garment to form a beading pocket;

(2) a cord means held within said beading pocket to form the bead to facilitate retaining of said bead means within said retaining channel; and

(e) a retaining clip being detachably secureable to the visor to hold said beading means within said retaining channel, said retaining clip including an inwardly extending edge disposed in close spaced relation with respect to said inner frame member to prevent withdrawal of said beading member therepast.

4,183,102
INFLATABLE PROSTHETIC DEVICE FOR LINING A BODY DUCT
Jacques Guiset, 62, rue Edouard Delesalle, Lille (Nord), France
Filed Sep. 8, 1977, Ser. No. 831,409
Int. Cl.[2] A61F *1/00, 1/24;* A61M *29/02*
U.S. Cl. 3—1.4 **25 Claims**



17. A prosthetic device for introduction into a duct and for lining an interior wall portion of the duct, the device comprising a plurality of generally toroidal, hollow, inflatable sleeves placed side-by-side with side walls of adjacent sleeves integrally joined with one another, inner walls of said sleeves being juxtaposed to define an internal longitudinal channel, outer walls of said sleeves being adapted to engage the interior wall of said duct and said integrally joined side walls forming transverse partitions connecting said inner and outer walls, said sleeves being made of a material that is impermeable to the pressurized fluid, wherein at least the outer wall of each sleeve is made of flexible material capable of deforming to conform to the shape of said interior wall portion of the duct, and means for introducing a pressurized fluid into said sleeves, said side walls being apertured to connect the interiors of said sleeves with one another to supply pressurized fluid to all of said sleeves, whereby the device can be introduced into, and positioned within, said duct in a deflated state and then inflated by introducing the pressurized fluid into said sleeves so that said outer walls of said sleeves grip said interior wall portion of the duct and so that a longitudinal channel is defined by the inner walls of the sleeves.

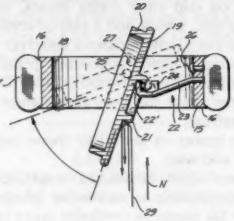
4,183,103
PROSTHETIC ONE-WAY HEART VALVE
Eric Bloch, 556 W. 141st St., New York, N.Y. 10031
Filed Jun. 29, 1978, Ser. No. 920,302
Int. Cl.[2] A61F *1/22*
U.S. Cl. 3—1.5 **12 Claims**

1. A prosthetic one-way heart valve comprising:

(a) a generally annular valve body having a central opening defining a blood flow passageway,

(b) a disc within said valve body and having a periphery substantially complementary to the periphery of said opening, and

(c) means supporting said disc for pivotal movement, with respect to said body, between a position in which blood is permitted to flow through said body and a position in which flow of blood through said body is blocked, said means including:



(I) a ring-like protuberance projecting from one face of said disc in the general direction of flow through the valve, said protuberance being radially spaced from the peripheral edge of said disc to define an abutment responsive to fluid flowing in the no-flow direction of the valve for aiding pivotal movement of said disc to a position in which the valve is closed, and

(II) fulcrum means projecting into the central opening from said valve body, said fulcrum means engaging the inner surface of said protuberance such that said disc pivots about said fulcrum means.

4,183,104

JOINT IMPLANT

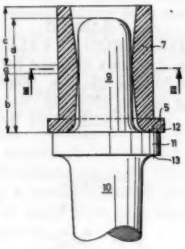
Otto Frey, Winterthur, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland

Filed May 23, 1978, Ser. No. 908,690

Claims priority, application Switzerland, Jun. 22, 1977, 7648/77

Int. Cl.[2] A61F *1/24*

U.S. Cl. 3—1.91 **14 Claims**



1. A joint implant comprising

a pair of anchoring elements for anchoring in respective bones of a joint; and

means articulating said elements together in hinged relation, said means including a socket disposed in one of said elements and a pin disposed in the other of said elements, said socket having an elongated aperture therein with a reduced cross-sectional portion extending along a length of said aperture and widening cross-sectional portions on opposite sides of said reduced cross-sectional portion, said pin being of non-circular cross-section and extending into said aperture in mating engagement with said reduced cross-sectional portion and in spaced relation to said widening cross-sectional portions.

4,183,105

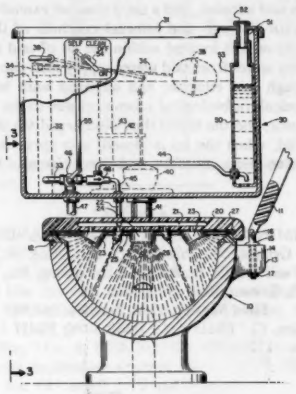
SELF-CLEANING TOILET

Leo K. Womack, P.O. Box 53133, New Orleans, La. 70153

Filed Nov. 3, 1977, Ser. No. 848,084

Int. Cl.[2] E03D *9/00*; A47K *13/00, 13/30*; B08B *3/02*

U.S. Cl. 4—1 **10 Claims**



1. A self-cleaning toilet embodying the combination of an open top toilet bowl and elevated reservoir tank mounted above said bowl, the reservoir tank including a water supply inlet for supplying water to said reservoir tank for discharge to said toilet bowl, and a separate compartment within which a biodegradable chemical or biological substance can be stored, removed therefrom and admixed with water, and the liquid formed thereby supplied to the toilet bowl to clean, disinfect and deodorize said toilet bowl, which comprises:

a seat and lid pivotally attached to said open top toilet bowl, the seat being pivotally attached to a side of said bowl from a juncture of attachment disposed at substantially right angles to the juncture of attachment of said lid so that the seat can be lowered atop the bowl, or raised while the lid is lowered,

a circumferential seal on said bowl which seals the lid upon the bowl on closure,

internal conduits and nozzle outlets, the nozzle outlets being located on the underside of said lid and communicated via said internal conduits with said water supply inlet,

an outlet from the compartment within the reservoir tank through which said biodegradable chemical or biological substances can be passed,

a float actuated valve located within the reservoir tank which is connected to said water supply inlet for introducing and regulating the flow of water from said water supply inlet to said tank, the flow of water being shut off when the float which actuates said float actuated valve is high due to a high water level, the flow of water to the bowl, being initiated when the float is low due to a low water level in the reservoir tank,

a discharge conduit located in the bottom of said reservoir tank through which water can be discharged from said tank to the toilet bowl,

a float seated within the discharge conduit of said reservoir tank through which water can be discharged from the reservoir tank for flushing the toilet, and the water level in the tank restored by the reseating of said float which permits the bowl to refill by the introduction of water through said water supply inlet to the reservoir tank which begins with the opening of said float actuated valve

as the float operatively associated therewith falls with the water level, and ends with the closing of said float actuated valve as the float operatively associated therewith rises with the water level to cut off the flow of water to the tank,

an eductor communicated via a first conduit with the outlet of the compartment within said reservoir tank through which said stored biodegradable chemical or biological substances can be passed,

a second conduit communicating said water supply inlet with said eductor, and a third conduit extending from said eductor through said internal conduits of the lid to the nozzle outlets located within the lid of said toilet bowl,

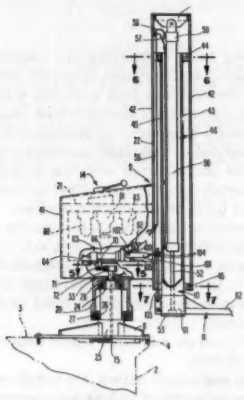
whereby water from said water supply inlet can be delivered through said eductor, and admixed with biodegradable chemicals or biological substances due to the action of the eductor, and the liquid then discharged via the nozzles of the lid, when the lid is closed, as a spray into the toilet bowl to clean, disinfect, and deodorize said bowl.

4,183,106

SWIMMING POOL LIFT FOR THE HANDICAPPED

Gary E. Grimes, 572 Powderhorn Rd., King of Prussia, Pa. 19406, and Gerald D. Brown, Landenberg, Pa., assignors to Gary E. Grimes, King of Prussia, Pa.

Filed Sep. 11, 1978, Ser. No. 941,065
Int. Cl.[2] E04H *3/16*; B66B *9/00*; E04H *3/18*
U.S. Cl. 4—172 **15 Claims**



1. A swimming pool lift for handicapped persons, the lift being installed adjacent the edge of a swimming pool and comprising:

a base secured on the poolside surface adjacent the edge of the pool;

a bearing post fixed to the base and extending vertically upwardly therefrom;

bearing frame means surrounding said post;

axial bearing means supported on a shoulder adjacent one end of said post and connected to said bearing frame means;

radial bearing means supported on a shoulder spaced from said axial bearing means and connected to said bearing frame means;

service frame means fixedly connected to said bearing frame means;

lift frame means fixedly connected to said service frame means, said bearing frame means, said service frame means, and said lift frame means being rotatable in unison on said bearing means;

rotate motor means connected between said bearing post and said bearing frame means for causing said rotary motion;

lift means connected to said lift frame means for rotation therewith and for vertical reciprocating motion with respect thereto;

lift motor means connected between said lift frame means and said lift means for causing said reciprocating motion;

chair frame means fixedly connected to said lift means for rotation and for reciprocating motion therewith, the chair frame means extending radially outwardly of the axis of the reciprocation of the lift means;

chair means on said chair frame means, the chair means including a seat, a back and a pair of arms secured to the back means and extending above and over the seat, one of the arms being pivotally connected to the back whereby the arm can be swung upwardly away from the seat to provide open space for a person to enter the seat or to depart therefrom;

foot platform means on said chair frame means in front of and below said seat;

lift control mechanism connected to said lift motor means and being actuatable to cause the lift motor means to operate the lift means to vertically move the chair means into a horizontal transfer zone located at an elevation greater than that of the poolside surface and to vertically move the chair means out of the transfer zone;

rotate control mechanism connected to said rotate motor means and being actuatable to cause the rotate motor means to rotate said chair means when the chair means is in said transfer zone as between an inboard position and an outboard position, in the inboard position said chair means extending over and above the poolside surface and in the outboard position the chair means extending outwardly from the edge of the pool over and above the surface of the water;

said lift control mechanism being actuatable, when said chair means is in said inboard position, to cause the lift motor means to move said chair means vertically as between the inboard position and a load/unload position, in the latter position said chair means being engaged with the poolside surface in condition for a person to enter or leave; and

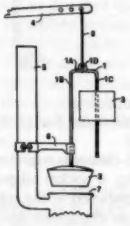
said lift control mechanism being actuatable, when the chair means is in said outboard position, to cause said lift motor means to move said chair means vertically as between said outboard position and a position within a water zone wherein the chair means is submerged in the water to an extent permitting a person to enter or leave.

4,183,107

VARIABLE FLUSH TOILET VALVE MECHANISM

Nicholas S. Hare, P.O. Box 833, and Miles J. Jackson, P.O. Box 67, both of Monroeville, Ala. 36460

Filed Jul. 24, 1978, Ser. No. 927,661
Int. Cl.[2] E03D *1/14, 3/12*
U.S. Cl. 4—324 **5 Claims**



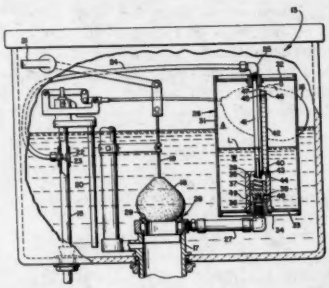
1. For use in a conventional ball-valve type of water tank for flush toilets which includes therein a flush lift-lever operative by means of a flush handle located external of said tank, an overflow standpipe, a stem-guide bracket firmly attached to

said standpipe, and a water outlet valve seat: a selectively variable valving device comprising, in combination: an elongated U-shaped rod of solid circular cross-section and having a substantially flat horizontally positioned top portion interconnecting two downwardly extending vertical leg portions, the first of said legs passing through the bore in said stem-guide bracket and terminating at its lower open end in means for removably attaching a valve-closure member, the second leg being notched, undulated or otherwise provided with a frictionalized outer surface along its length; a solid non-buoyant valve-closure member removably attached directly to said first downwardly extending leg at its lower end; and a buoyant float having a circular central bore extending therethrough complementary in size to the circular cross-section of said rod, movably positioned on said second leg and frictionally supported thereon.

4,183,108
FLUSH TOILET SYSTEM

William H. Hamilton, 16765 32nd Ave., SW., Seattle, Wash. 98166

Continuation-in-part of Ser. No. 812,066, Jul. 1, 1977, Pat. No. 4,142,262. This application Oct. 17, 1978, Ser. No. 952,130
Int. Cl.² E03D *3/10, 1/22*
U.S. Cl. 4—354 **8 Claims**



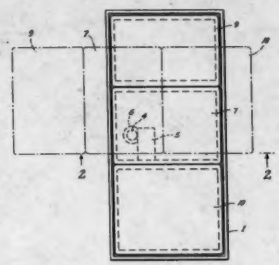
1. In a flush toilet system having a bowl, a reservoir tank wherein water may be stored in a primary body at a predetermined level to establish a predetermined pressure head and means for selectively releasing water from said tank into the bowl during flushing, the provision of further means operative when water is released from said reservoir tank for automatically discharging a predetermined quantity of water from a source wherein water is contained at a pressure higher than the pressure of the water in the reservoir tank into water being released from said tank into said bowl at sufficiently high velocity to materially increase the overall energy of the water and in the bowl and effect increased efficiency during flushing, and means providing a predetermined time delay between initiation of release of water from said reservoir tank and discharge from said source.

4,183,109
SECTIONAL BED

William H. Howell, Texas Tower, Houston, Tex. 77002

Filed Apr. 21, 1978, Ser. No. 898,788
Int. Cl.² A47C *3/32;* A61G *7/10*
U.S. Cl. 5—60 **6 Claims**

1. In a bed, a rigid rectangular frame, a sectional spring and mattress pivotally mounted on said frame, means for elevating said sectional spring and mattress and means for selectively adjusting the position of the sections and means for pivoting the sections from longitudinal to transverse relative to the frame, said means for selectively adjusting the position of the sections being mounted on the rigid rectangular frame adjacent

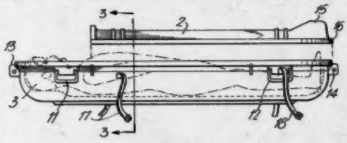


one side member thereof and midway between the ends of said rectangular frame.

4,183,110
CASUALTY TRANSFER SYSTEM

Derek J. Kidd, and Leslie B. Goodwin, both of Victoria, Canada, assignors to Her Majesty the Queen in right of Canada, as represented by the Minister of National Defence, Ottawa, Canada

Filed Mar. 6, 1978, Ser. No. 883,900
Claims priority, application Canada, Apr. 7, 1977, 275897
Int. Cl.² A61G *1/02;* A47B *96/00*
U.S. Cl. 5—82 R **8 Claims**



1. A casualty transport system comprising:
(a) a substantially rigid elongated concave body shell member dimensioned to receive a patient in a prone position through an open side thereof;
(b) a substantially rigid self-supporting prefabricated lid member detachably securable over said open side of said body shell to thereby cover said patient from feet to neck; and
(c) a lining of resilient polyurethane foam preformed to the shape of a 75 percentile man, for both resiliently supporting said patient in said body shell and conferring buoyancy and thermal protection to the transport system.

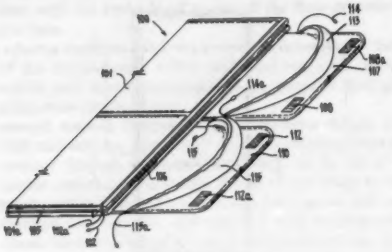
4,183,111
SLEEPING BAGS

Pelepa Zahavkochav, P.O. Box 190, Goulburn, Australia (2580)

Filed Sep. 18, 1978, Ser. No. 943,074
Claims priority, application Australia, Sep. 22, 1977, PD1774
Int. Cl.² A47G *9/08*
U.S. Cl. 5—343 **7 Claims**

1. A sleeping bag constructed of a flexible panel folded in half to form upper and lower panel portions of said bag with adjacent edge sections having complementary fastening means thereon whereby to seal said bag except for an entrance opening at the head thereof; a pair of pockets respectively on the outer side of said upper and lower panel portions and each open at the head of the bag; a module removably fastened within each pocket and adapted to be folded outwardly therefrom, while still fastened, to form a pillow at the head of the

bag; each module including a peripheral drawstring which when tightened draws said module into the form of a hood; and



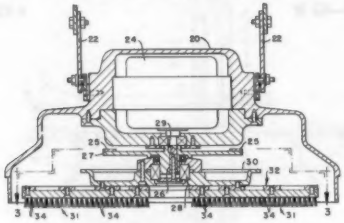
each pocket including fastening means on the opposed internal walls thereof whereby two modules can be fastened therein at the same time, to form a pillow and a hood for the bag.

4,183,112

DEVICE FOR SCRUBBING CARPET

Robert S. Brown, and Robert C. Fay, both of Spartanburg, S.C., assignors to Milliken Research Corporation, Spartanburg, S.C.

Filed Aug. 2, 1977, Ser. No. 821,172
Int. Cl.[2] A47L *11/34*
U.S. Cl. 15—50 R **27 Claims**



1. A device for cleaning carpets, comprising:
a frame;
a housing mounted on said frame;
a substantially vertical shaft rotably supported by said housing;
means for rotating said shaft;
an orbiting scrubber element rotatably mounted on said shaft, said scrubber element being rotatable about an axis which is substantially parallel to, but offset from the axis of rotation of said vertical shaft, said scrubber element having:
a body member;
a plurality of bristles fixed to said body member; and,
means mounted on said scrubber element and engaging said carpet for pressing powdered cleaning composition into the pile of said carpet and for minimizing redistribution of said powdered cleaning composition, said means being mounted closely adjacent to the outer periphery of said scrubber element.

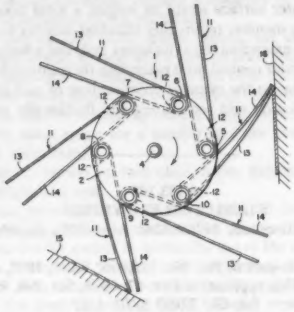
4,183,113

ROTARY SCRAPER

Robert Fusco, 4923 8th Ave., Brooklyn, N.Y. 11220

Filed Jan. 6, 1978, Ser. No. 867,603
Int. Cl.[2] A46B *5/06, 13/02;* A47L *13/06*
U.S. Cl. 15—236 C **3 Claims**

1. A rotary scraper comprising a hub having a pair of spaced apart disc shaped plates; a central drive shaft fixedly attached to said hubs for connection to exterior rotational drive means; a plurality of equally spaced connecting rods fixedly attached to and extending between said plates along their outer periphery; and a plurality of round wire scraper members pivotally attached to each of said connecting rods; said scraper members each comprising a U-shaped spring having a central coil completely encircling one of said connecting rods and a pair of outwardly extending equal length, straight, parallel, spring fingers adapted for flexible sliding engagement with a work



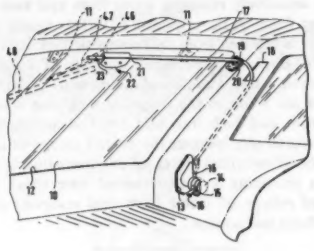
surface upon rotation of the hub; said fingers being restrained in an angular position relative to the work surface by the engagement of one finger of each pair at a point along its length with the central coil of each U-shaped spring disposed on the immediately adjacent connecting rod, so that the flexibility of said engaged finger of each pair is less than the flexibility of the unengaged finger of each pair to provide greater stiffness.

4,183,114

REAR WINDOW WIPER MECHANISM FOR A MOTOR VEHICLE

Stephen J. R. Eden, Whittleford, England, assignor to Chrysler United Kingdom Ltd., London, United Kingdom

Filed Jan. 19, 1978, Ser. No. 870,798
Claims priority, application United Kingdom, Jan. 31, 1977, 03905/77
Int. Cl.[2] B60S *1/02*
U.S. Cl. 15—250.25 **8 Claims**



1. A vehicle body having an opening rear window hinged along one edge for opening movement, a window wiper drive unit mounted on the inner side of the window adjacent said one edge part-way along the edge, the drive unit having an output shaft extending through an opening in the window with the shaft axis normal to the plane of the window, a wiper secured to the shaft on the outer side of the window, a motor unit for the wiper drive unit mounted on the inner side of the vehicle body, a flexible mechanical drive transmission extending from the motor unit to the drive unit and means to guide the transmission along the inner side of the window generally parallel

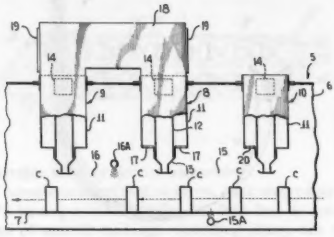
to said edge to the wiper unit so that the transmission can accommodate opening and closing of the window.

4,183,115

BLOW-OFF DUCTING AND BAFFLING FOR CAN WASHER

Armen Zakarian, Arlington Heights, Ill., assignor to The Continental Group, Inc., New York, N.Y.

Filed Sep. 18, 1978, Ser. No. 943,413
Int. Cl.[2] B08B *3/40, 5/02*
U.S. Cl. 15—302 **4 Claims**



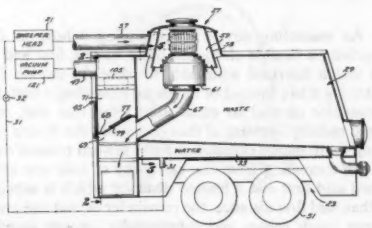
1. A container washer of the type including an elongated housing, a conveyor for moving containers through said housing, a wash station for applying a wash liquid to containers moving through said housing, a rinse station spaced downstream from said wash station for applying clean rinse water to washed containers, a first blow-off station intermediate said wash station and said rinse station, a second blow-off station adjacent to and spaced downstream of said rinse station, each of said blow-off stations being of the type including a downwardly opening nozzle projecting from a surrounding duct normally defining an air intake supplying air for the respective nozzle, and means for directing air from each said air intake under pressure to the respective nozzle; the improvement comprising means closing said first blow-off station duct against entrance of air from below to thereby exclude wash components, and a duct section coupling said second blow-off station duct to said first blow-off station duct to supply air drawn from the vicinity of said rinse station to said first blow-off station.

4,183,116

WET-DRY VACUUM SWEEPER

David L. Thompson, 2019 Wardlow Rd., Long Beach, Calif. 90801

Filed Apr. 21, 1978, Ser. No. 898,836
Int. Cl.[2] B01D *50/00*
U.S. Cl. 15—353 **10 Claims**



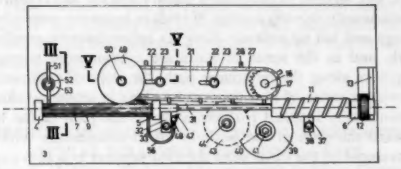
1. A filtered vacuum sweeper comprising:
a frame;
wheels for carrying said frame from a surface to be swept;
a sweeper head carried from said frame for passing over said surface;
a separator mounted on said frame and including an inlet and discharge outlet;
vacuum means for aspirating air and waste from said head to said separator;
a duct connected between said head and the inlet to said separator;
a filter chamber including spaced apart oppositely disposed end walls and side walls, an inlet formed in one of said end walls, a filter removal opening formed in the opposite end wall and an outlet formed in one of said side walls;
a rigid walled tubular filter having one end surrounding said filter inlet and projecting therefrom to abut its opposite end against the opposite end wall;
a separate outlet conduit leading from said separator discharge outlet to said filter inlet;
a waste receptacle mounted on said frame for receiving waste from said separator and from the interior of said filter; and
a removable cover attached to said opposite end wall and removably covering said filter removal opening whereby said sweeper may be moved over said surface and said vacuum means will aspirate waste picked up by said sweeper head to said separator where larger particles of waste will be separated from said air and said air will then be directed through said outlet conduit to said filter inlet, through the wall of said tubular filter and out said filter outlet and when said filter becomes spent said cover may be removed and said filter removed out said removal opening for cleaning.

4,183,117

APPARATUS FOR SPLITTING, CLEANING AND SKINNING POULTRY GIZZARDS

Pieter Meyn, Noordeinde 68, Oostzaan, Netherlands

Filed Nov. 3, 1977, Ser. No. 848,030
Claims priority, application Netherlands, Nov. 28, 1976, 7613251
Int. Cl.[2] A22C *21/00*
U.S. Cl. 17—11 **6 Claims**



1. Apparatus for splitting and skinning poultry gizzards comprising:
a frame;
an endless transport chain running over two vertical sprocket wheels rotatably mounted on said frame;
a vertical circular knife mounted for rotation adjacent the working flight of said transport chain on said frame;
a spreading bar mounted adjacent said working flight of said transport chain on said frame;
a set of horizontal peeling rolls mounted for rotation on said frame; and
means for driving said transport chain, said knife and said peeling rolls;
said transport chain being adapted to receive the gizzards to be processed at one of said sprocket wheels, for moving the received gizzards past said knife in order to split the gizzards and over said spreading bar in order to fold open the split gizzards, and for finally delivering the split and spread gizzards to said peeling rolls at the other of said sprocket wheels to remove the skin from the gizzards;

the apparatus further comprising:

two pressure discs mounted on either side of said other sprocket wheel and coupled therewith for synchronized and concentric rotation;

the diameter of said pressure discs being larger than the diameter of said other sprocket wheel; and

said pressure discs being adapted to lift the split and spread gizzards from said transport chain and press them briefly with their inner surface on said peeling rolls.

4,183,118

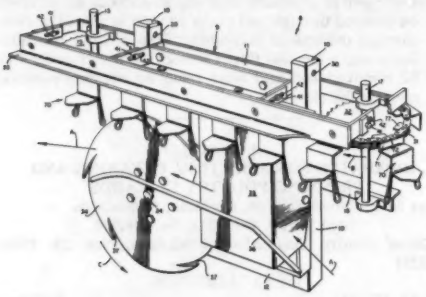
OIL BAG REMOVER

Kenneth Graham, Rte. 2, Dawsonville, Ga. 30534, and John Graham, Rte. 8, Gainesville, Ga. 30501

Filed Mar. 20, 1978, Ser. No. 890,603

Int. Cl.[2] A22C *21/00*

U.S. Cl. 17—52 **13 Claims**



1. The method of processing poultry and the like comprising continuously moving a series of birds in sequence suspended in a legs and tail up attitude along an approximately rectilinear path, and as the series of birds are continuously moved in sequence along the rectilinear path, the steps of continuously moving a series of bird support brackets in sequence along a downwardly inclined path from above the path of the birds toward the path of the birds in timed relationship with the movement of the birds until the bird support brackets extend between the legs of the birds and at least partially stabilize the birds as the birds continue to move along the path, tilting the birds further into the support brackets to orient the backs of the birds toward an approximately upright attitude, cutting the oil bag of each bird from the bird while the back of each bird is approximately upright.

9. Apparatus for removing oil bags from poultry wherein birds are suspended and moving in sequence along a predetermined path in a tail and legs-up attitude, said apparatus comprising a disc cutter rotatable about an axis approximately perpendicular to the path of movement of the birds, said disc cutter defining a series of spaced notches about its periphery with the opening of each notch angled toward the direction of rotation of the disc cutter, a stationary cutting element in juxtaposition with the periphery of said disc cutter, and means for swinging the birds moving along the predetermined path toward said disc cutter to place the oil bag of each bird in the path of a notch of the disc cutter, whereby the notches of the disc cutter are inserted about the oil bags of the bird and coact with the stationary cutting element to sever the oil bags from the birds.

4,183,119

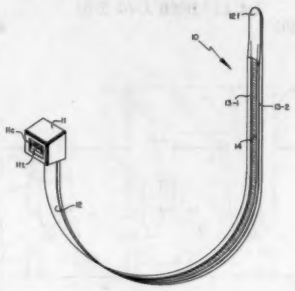
HARNESSING DEVICE WITH GRIPPER RAILS

John H. Stewart, Needham, and Leo P. Dekkers, Scituate Harbor, both of Mass., assignors to Dennison Manufacturing Company, Framingham, Mass.

Filed May 15, 1978, Ser. No. 905,707

Int. Cl.[2] F16L *33/00*

U.S. Cl. 24—16 PB **8 Claims**



1. A harnessing device comprising

a head having a guide channel therein,

a locking tang within said head, and

a strap connected to said head of and having side rails, said strap having a plurallity of members between said side rails for sequentially engaging said locking tang when said strap is inserted into said channel, each side rail comprises a protuberance which diverges continuoulsy upwardly and downwardly from the central portion of said strap.

4,183,120

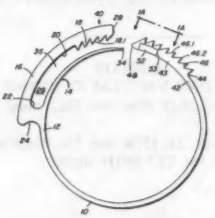
ENCIRCLING DEVICES

George W. Thorne, 2625 Sea Island, Ft. Lauderdale, Fla. 33301

Filed May 19, 1978, Ser. No. 907,712

Int. Cl.[2] F16L *33/00*; A44B *21/00*

U.S. Cl. 24—16 R **14 Claims**



1. An encircling device for clamping a hose or the like comprising a flexible elongated body having first and second ends which interlock adjustably to close the device, the first end having a bay formed of two arms extending a first distance substantially parallel to each other from that end, one arm located radially outward of the other when the device is closed having tooth means oriented radially inward toward the other arm and extending from the extremity of said one arm back toward said first end a limited distance which is substantially less than said first distance, the remainder of said one arm being without tooth means and substantially smooth providing a region in said bay for freely receiving said second end, means resiliently urging said one arm with said tooth means toward the other arm of said bay, the second end having substantially exclusively a tongue fitted with tooth means oriented radially outwardly when the device is closed and extending along one

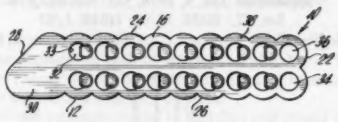
side of said tongue a third distance longer than said limited distance for adjustably interlocking with all of the teeth in said bay.

4,183,121

SEPARABLE FASTENER

Sydne Cousins, New York, N.Y., assignor to Bonnie Enterprises, Inc., Cranford, N.J.

Filed Oct. 20, 1977, Ser. No. 843,762
Int. Cl.[2] A44B *17/00*
U.S. Cl. 24—204 15 Claims



1. A separable fastener device comprising:

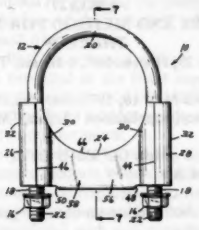
a pair of complementary mating strips, each strip comprising a body having a substantially flat first face at least one portion of spaced openings extending along one of the axes and a plurality of tongues forwardly projecting from said strip, with each tongue having a flat underside substantially parallel to said first face and having a major portion offset from said strip and having a minor portion overlapping said opening and partially covering the latter with the free end of said tongue extending less half the distance to the opposing edge of said opening, each of said tongues having a degree of flexibility and being sized to fit snugly within the corresponding portion of a corresponding opening of the opposite strip with a snap fit when one strip is placed upon the other strip with the first surfaces thereof facing each other and the uncovered portions of the openings of each strip registering with the tongues of the opposite strips, whereby when the opposite second surfaces of said strips are pressed toward each other, said tongues are flexed and transversely bypass each other and engage respective openings in opposite strips whereby said strips are releasably locked together by said interfitting tongues and openings and the overlapping of said tongues.

4,183,122

U-BOLT CLAMP ASSEMBLY

Wayne M. Wagner, Apple Valley, Minn., assignor to Donaldson Company, Inc., Minneapolis, Minn.

Filed Sep. 8, 1978, Ser. No. 940,851
Int. Cl.[2] F16L *33/10*; B65D *63/00*
U.S. Cl. 24—277 20 Claims



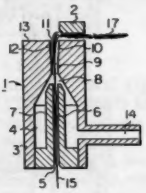
1. A saddle for a U-bolt clamp assembly comprising a single sheet metal member, said member being folded to form a two-layer web portion and a pair of tubular portions, each tubular portion being adapted to receive a leg of a U-shaped bolt, and each tubular portion being formed of two layers of said sheet metal around a major portion of the circumference of each tubular portion.

4,183,123

YARN TEXTURING APPARATUS

Kenzo Tanaka, and Tetsuhiko Endō, both of Otsu, Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Filed Dec. 15, 1977, Ser. No. 860,909
Claims priority, application Japan, Jun. 24, 1977, 52/74454
Int. Cl.[2] D02G *1/16*
U.S. Cl. 28—273 9 Claims



1. In a yarn texturing apparatus for producing a multifilament yarn containing complex interfilament entanglement comprising a housing having inlet and outlet ends connected by a yarn passage, a turbulence section in the yarn passage, an exit orifice constituting the yarn outlet and communicating with the turbulence section, and means for introducing pressurized gas into the yarn passage, whereby a multifilament yarn is subjected to an action of the turbulence of the pressurized gas in the turbulence section and, thereafter, is blown out of the exit orifice together with the pressurized gas, the improvement comprising: a yarn guide for separating said blown filament yarn from said blown gas while guiding said yarn along a guide surface of said yarn guide in a direction approximately perpendicular to the flow direction of said blown gas immediately after the filament yarn comes out of the yarn outlet is provided, outside of said housing and in the proximity of the exit end of said exit orifice, in a condition such that said yarn guide does not cross the center-line of said exit orifice, said guide surface of said yarn guide facing the yarn outlet end surface of said housing and one end of said yarn guide facing the flow of said blown gas at a distance of 0 to 8 mm. from the periphery of said yarn outlet.

4,183,124

METHOD OF AND APPARATUS FOR FABRICATING SPIRAL WRAPPED CARTRIDGE CASES

Robert F. Hoffman, Ballwin, Mo., assignor to Kisco Company, St. Louis, Mo.

Filed Nov. 21, 1977, Ser. No. 853,047
Int. Cl.[2] B21K *21/04*; B21D *51/54*; B23P *15/22*
U.S. Cl. 29—1.3 5 Claims

1. A method of fabricating spiral wrapped cartridge cases or the like each of which includes a base and a hollow body made of spirally wrapped sheet metal with the margins of the sheet metal at least partially overlapped, one end of said body being securable to the base and the other end of the body being open and constituting a mouth for the cartridge case, said method comprising:

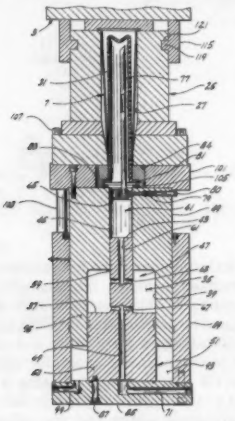
placing a base and a body in a cavity in a die, the cavity being shaped to form the body into the desired shape for the cartridge casing or the like by expansion of the body, said die being part of an assembly comprising an expandable bladder in the cavity and a hydraulic pressure generator adapted to deliver hydraulic fluid under pressure to the bladder for expanding it on compression of said assembly;

the body being positioned for expansion of the bladder therein;

positioning said assembly with the base and body in the die in a press between platens of the press;

closing the platens to effect compression of said assembly for delivery of hydraulic fluid under pressure to the bladder to expand it for forming the body in the die;

during an initial portion of the closing motion of the platens, delivering hydraulic fluid from the hydraulic pressure generator at a relatively low hydraulic pressure level and at a relatively high flow rate to said bladder to expand said bladder into engagement with the body, in response to the closing of the platens;



during a subsequent portion of the closing motion of the platens, delivering hydraulic fluid from the hydraulic pressure generator at a relatively high hydraulic pressure level and at a relatively low flow rate to said bladder to expand said bladder to form the body in the die cavity, in response to the closing of the platens;

and including moving the platens through said initial and subsequent portions of their closing motion at a substantially constant speed.

4,183,125

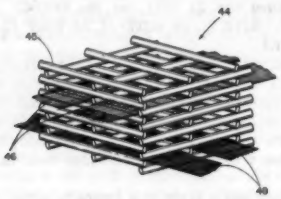
METHOD OF MAKING AN INSULATOR-SUPPORT FOR LUMINESCENT DISPLAY PANELS AND THE LIKE

Ralph L. Meyer, Elgin, and Alan Sobel, Evanston, both of Ill., assignors to Zenith Radio Corporation, Glenview, Ill.

Filed Oct. 6, 1976, Ser. No. 730,113

Int. Cl.[2] H01J *9/02, 9/18*

U.S. Cl. 29—25.15 **14 Claims**



1. A method of making an extended area cellular spacer-support for separating electrodes in a luminescent display panel and/or for providing support against atmospheric pressure on the panel, comprising:

forming a stack of mutually registered open lattices of highly flexible insulative filaments, including tensing the filaments while spacing them such that the stack of filaments defines an array of narrow transverse openings therethrough which serve in the panel as image-element-associated radiation or particle passageways in the stack; and

mutually bonding said lattices of filaments to form a unitary cellular latticework.

4,183,126

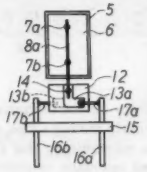
PROCESS FOR PREPARING QUARTZ OSCILLATOR

Hitoshi Ikeno, Koganei; Mitsuyuki Sugita, Ichikawa, and Hirofumi Yanagi, Tokyo, all of Japan, assignors to Kabushiki Kaisha Seikosha, Japan

Division of Ser. No. 721,784, Sep. 9, 1976, abandoned. This application Jan. 9, 1978, Ser. No. 867,876

Int. Cl.[2] B23K *31/02;* **H04R** *1/02*

U.S. Cl. 29—25.35 **15 Claims**



2. In a method of making a quartz oscillator, the combination of steps of:

preparing a quartz blank with parallel opposite faces and with conductive electrode films on both of said faces,

preparing a substrate of insulating material with lead connections plated on opposite faces of said substrate, the thickness of said substrate being approximately equal to the thickness of said quartz blank,

applying solder parts to said lead connectors of said substrate and at selected positions on both of said opposite faces of said quartz blank,

providing a supporting frame for supporting said quartz blank and said substrate,

positioning said quartz blank and said substrate on said frame with opposite faces of said quartz blank at least approximately co-planar with opposite faces of said substrate and with said quartz blank and substrate spaced from one another in an edgewise direction,

positioning holding wires parallel to and spaced slightly from opposite faces of said quartz blank and said substrate and in engagement with said solder parts on said quartz blank and substrate, and

applying heat to said solder parts to fuse them temporarily and thereby couple said holding wires with said quartz blank and said substrate.

4,183,127

TOP ROLLERS AND METHOD FOR MANUFACTURE THEREOF

Takeshi Suzuki, 19, Hacchodori, 4-chome, Toyohashi-shi, Aichi-ken, Japan

Filed May 18, 1977, Ser. No. 798,018

Claims priority, application Japan, May 20, 1976, 51-63312[U]

Int. Cl.[2] B21B *13/02*

U.S. Cl. 29—116 R **4 Claims**

1. A top roller, comprising:

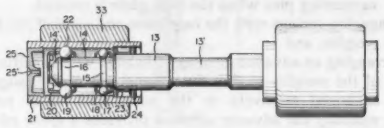
a cylindrical shell having an annular groove in the interior wall thereof;

a cylindrical rotatable arbor disposed inside and coaxial with said shell, said arbor having two axially spaced grooves therein, one of said arbor grooves being substantially coplanar with said groove in said shell;

a first plurality of balls of equal size disposed in and extending between said coplanar grooves;

a second plurality of balls of equal size disposed in the other groove of said arbor and extending between said other groove and an adjacent ungrooved interior wall portion of said shell;

first and second retainers for retaining said first and second plurality of balls in position respectively;



said first plurality of balls each having a diameter greater than the diameter of each of said second plurality of balls;

said arbor having a free end tapered for feeding lubricant to at least one of said plurality of balls,

the one of said retainers closest to said free end of said arbor having a plurality of lubricant feeding blades.

4,183,128

CONTROLLED DEFLECTION ROLL

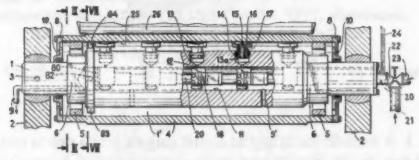
Ignazio Marchioro, Schio, Italy, assignor to Escher Wyss Ltd., Zurich, Switzerland

Filed Jun. 26, 1978, Ser. No. 919,042

Claims priority, application Switzerland, Aug. 10, 1977, 9792/77

Int. Cl.[2] B21B *13/02*

U.S. Cl. 29—116 AD **9 Claims**



1. A controlled deflection roll comprising, in combination:

a fixed support;

a roll shell;

means for mounting said roll shell to be rotatable about said fixed support;

hydraulic pressure elements at which there is supported said rotatable roll shell;

said fixed support being provided with a number of pressure compartments;

each pressure compartment being bounded by a related one of the pressure elements;

means for infeeding a hydraulic pressure medium to said pressure compartments for pressing the pressure elements against an inner surface of the roll shell and supporting said roll shell at said fixed support;

said means for infeeding the pressure medium comprising a longitudinal bore provided at the fixed support and extending in the lengthwise direction of said fixed support;

connection bores leading from said longitudinal bore to the individual pressure compartments;

a plurality of pressure regulators for setting the pressure of the hydraulic pressure medium which is infed to the individual pressure compartments;

said pressure regulators being arranged in said fixed support and operatively associated with said pressure elements;

each of said pressure regulators having a housing and actuation means insertably arranged in said longitudinal bore of said fixed support;

a pressure medium infeed line for the infeed of the pressure medium with which there are connected each of said pressure regulators;

each of said housings having an outlet bore including a mouth portion;

means defining a sealing region surrounding the mouth portion of the related outlet bore;

each mouth portion being connected with the outlet bore of the related pressure compartment;

an hydraulic piston provided for said housing at a location opposite said sealing region;

said hydraulic piston sealingly closing an hydraulic pressure chamber and serving for pressing the sealing region of the outlet bore against a wall of said longitudinal bore of said fixed support; and

said hydraulic pressure chamber being connected with said pressure medium infeed line.

4,183,129

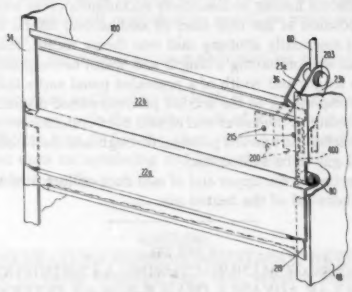
METHOD OF FORMING A SMOKE, FIRE AND AIR CONTROL DAMPER WITH STAMPED BLADE HINGE

Francis J. McCabe, Doylestown, Pa., assignor to Prefco Products, Inc., Buckingham, Pa.

Division of Ser. No. 729,831, Oct. 4, 1976, Pat. No. 4,113,232, which is a continuation-in-part of Ser. No. 689,994, May 26, 1976, Pat. No. 4,081,173. This application May 12, 1978, Ser. No. 905,211

Int. Cl.[2] B23P *15/00*; F16K *27/00*; F24F *13/14*

U.S. Cl. 29—157 R **3 Claims**



1. A method of constructing a damper comprising the steps of:

(a) forming at least one blade having at least two parallel offset surfaces joined by a transverse blade portion;

(b) stamping hook-shaped hinge portions in only opposite ends of said blade;

(c) providing a frame having an inwardly depending flange thereon which is notched on opposite sides thereof and is provided with hinge elements to receive and coact with said hook-shaped hinge portions; and

(d) assembling said blade into said frame to produce a damper wherein a seal is formed between overlapping portions of said parallel offset portions and opposite surfaces of said flange when the damper is in the closed position, said opposite surfaces being formed in spaced planes.

4,183,130

METHOD OF ASSEMBLY OF A SOLAR ENERGY DEVICE INCLUDING A DUCT-COLLECTOR

Orlo Rotunda, 1714 9th St., Greeley, Colo. 80631

Filed May 2, 1977, Ser. No. 793,045

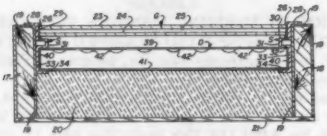
Int. Cl.[2] B23P *15/26*

U.S. Cl. 29—157.3 R **6 Claims**

1. A method of assembly of a solar energy device which includes at least one double pane glass panel of a standard width and length and presealed along the ends and edges, which comprises:

installing a pair of studs in parallel, at least partially upright position and spaced apart a distance corresponding to the width of said panel;

attaching to the inside of the respective studs a spacer having a front flange engaging the front of the corresponding stud, a first lateral flange extending toward the opposite stud and spaced rearwardly from said front flange a distance corresponding to the thickness of said presealed panel, a second lateral flange extending toward the opposite stud and spaced rearwardly from said first lateral flange a first predetermined distance, means spaced from said stud connecting said first and second lateral flanges, and rear flange means spaced rearwardly from said second lateral flange a second predetermined distance;



installing each said presealed panel against said first lateral flanges of said spacers so as to occupy the space bounded at each side by said front and first flanges;

installing at least one section of an elongated, hollow duct-collector having an essentially rectangular cross section in a position at the rear sides of said second lateral flanges and essentially abutting said rear flange means, each said duct section having a length and width corresponding to the length and width of a presealed panel and a thickness corresponding to the second predetermined distance;

connecting to the lower end of said duct-collector means for effecting the upward passage, through said duct-collector, of a gas to be heated; and

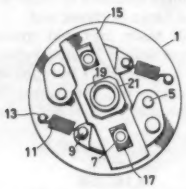
connecting to the upper end of said duct-collector means for withdrawal of the heated gas.

4,183,131

PROCESS OF MANUFACTURING A CENTRIFUGAL ANGULAR ADVANCE DEVICE FOR AN INTERNAL COMBUSTION ENGINE

Selichi Seya, Katsuta; Masao Omori, Hitachi, and Masahide Sakamoto, Katsuta, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Feb. 24, 1978, Ser. No. 880,936
Claims priority, application Japan, Mar. 1, 1977, 52-22341
Int. Cl.[2] B23P *19/00*
U.S. Cl. 29—434 **10 Claims**



1. A process of manufacturing centrifugal angular advance device for internal combustion engines comprising the steps of:

preparing a base plate driven by an internal combustion engine,

forming a weight as a blank with a plurality of holes,

securing a bushing to one of the holes of the weight, the bushing being free from hardening,

subjecting the weight to hardening,

machining precisely the inner face of the bushing after the step of subjecting the weights to hardening,

press-fitting a drive pin into the bore of the bushing,

connecting a pair of the weights to the base plate with supporting pins so that the pair of the weights are disposed on the base plate symmetrically with respect to an axis of the base plate, whereby the pair of weights swing about the supporting pins when the base plate is rotated,

engaging springs with the base plate and each of the pair of weights, and

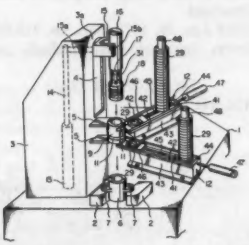
arranging an advance member to engage with the drive pins of the weights so that the advance member is angularly advanced relatively to the base plate when rotated, whereby the advance member provides a spark advance position.

4,183,132

ELASTIC RING FITTING DEVICE

Eiji Nagashima, Kofu, and Masanori Fukushima, Kushigata, both of Japan, assignors to Tokico Ltd., Kawasaki, Japan

Filed Aug. 21, 1978, Ser. No. 935,317
Claims priority, application Japan, Aug. 24, 1977, 52/101414
Int. Cl.[2] B29P *11/02*
U.S. Cl. 29—451 **6 Claims**



1. A method for fitting an elastic ring such as a piston seal, an O-ring or the like into an inner circumferential groove of an article such as a hydraulic cylinder or the like, said method comprises steps of inserting transversely the ring into an inner circumferential groove of a tubular retaining member through a cut-out portion of the retainer, inserting axially a chucking member into the retaining member and the elastic ring retained in the circumferential groove of the retaining member, deforming at least a portion of the circumference of the elastic ring in radially inward direction by inserting a pushing member radially inward of the retaining member through the cut-out portion and into an axial spacing of the chucking member, clamping the deformed elastic ring on the chucking member, extracting axially the chucking member with the resilient ring clamped thereon out of the retaining member and inserting into the article so as to locate the elastic ring clamped on the chucking member align with an inner circumferential groove of the article, and releasing the elastic ring from the chucking member whereby the elastic ring is fitted into the groove of the article by elastic restoring of itself.

4,183,133

HINGE PINTLE REMOVAL TOOL

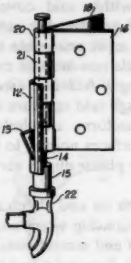
Thomas R. Abbott, 1266 Richard St., Orange, Calif. 92669

Filed Oct. 5, 1978, Ser. No. 948,817
Int. Cl.[2] B25B *27/14*
U.S. Cl. 29—275 **5 Claims**

1. A hinge pintle removal tool comprising:

a. a push rod having a pin connected at one end to a base, said base having a larger cross-section than said pin and having a free end adapted to receive blows from a blunt object to advance said push rod into said hinge, said pin having a free end with a cross-section adapted for inser-

tion into the hollow of a hinge for displacement of the hinge pintle; and



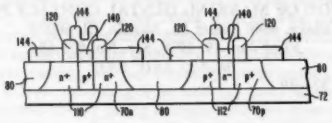
b. an elongated shield affixed along a portion thereof to said push rod at said base, said shield being adapted to partially overlie the circular periphery of a hinge when said pin is inserted in said hollow.

4,183,134

HIGH YIELD PROCESSING FOR SILICON-ON-SAPPHIRE CMOS INTEGRATED CIRCUITS

Harry G. Oehler, Glen Burnie; David S. Herman, Columbia, and James R. Cricchi, Catonsville, all of Md., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation of Ser. No. 769,138, Feb. 15, 1977, abandoned.
This application Dec. 11, 1978, Ser. No. 968,529
Int. Cl.[2] H01L *21/22, 21/26*
U.S. Cl. 29—571 **11 Claims**



1. A method for fabricating a semiconductor device on a semiconductor substrate supported by an insulating sapphire substrate, comprising the steps of:

forming at least two silicon regions separated by an insulating region having a substantially planar upper surface;

forming a first masking structure such that the surface of said first silicon region is exposed at a first and second area and is masked at a third area and the surface of said second silicon region is exposed at a fourth and fifth area and is masked at a sixth area,

doping said first and second areas of said first silicon region with a first conductivity;

doping said fourth and fifth areas of said second silicon region with a second conductivity;

oxidizing said first, second, fourth, and fifth areas of said first and second silicon regions to form a thick field oxide;

removing said first masking structure;

locating a concentration of dopant in the silicon substrate near the silicon-sapphire interface, beneath said third area of the first silicon region;

oxidizing said third and sixth areas of said first and second silicon regions to form an oxide;

forming metal connections to said first, second, fourth, and fifth areas; and

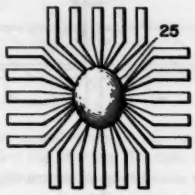
forming a conductive layer overlaying the oxide covering said third and sixth areas.

4,183,135

HERMETIC GLASS ENCAPSULATION FOR SEMICONDUCTOR DIE AND METHOD

John R. Welling, Scottsdale, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Division of Ser. No. 828,588, Aug. 29, 1977, Pat. No. 4,151,638.
This application Oct. 13, 1978, Ser. No. 951,418
Int. Cl.[2] B01J *17/00*
U.S. Cl. 29—588 **2 Claims**



1. A method of hermetically sealing a semiconductor die comprising the steps of:

(a) providing a semiconductor die having a plurality of contact pads thereon for receiving external leads in electrical connection therewith;

(b) providing means having a plurality of inwardly directed leads formed as an integral portion thereof with the inner ends of said leads positioned to match, or mate, with the contact pads;

(c) coating the die and contact pads with an unfired glass; and

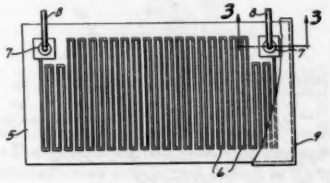
(d) positioning and bonding the leads of said means in mating engagement with the contact pads of the die and utilizing sufficient heat to fire the glass coating to form it into a solid mass encapsulating and hermetically sealing the die and lead bonds.

4,183,136

TEMPERATURE SENSING RESISTANCE DEVICE

Jeannine O. Colla, Whitefish Bay, Wis., assignor to Johnson Controls, Inc., Milwaukee, Wis.

Filed Aug. 3, 1977, Ser. No. 821,516
Int. Cl.[2] H01C *7/00, 17/28*
U.S. Cl. 29—620 **21 Claims**



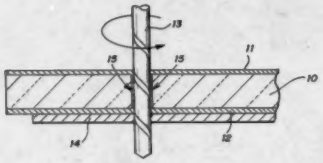
1. The method of forming a temperature sensitive thick film resistance sensor comprising forming a masking means defining a grid pattern, aligning said masking means on a base member formed of a high temperature, electrical insulating material, forcing an air fireable molecular bonding metallic paste including finely divided metal particles of a pure metal having a high temperature coefficient of resistance through said masking means onto said surface to form a deposited conductive thick film as a grid, and firing at an elevated bonding temperature the subassembly to form the paste to a selected resistivity and temperature coefficient and to sinter the grid and thereby molecularly bonding the thick film to the base member.

4,183,137

METHOD FOR METALIZING HOLES IN INSULATION MATERIAL

Robert B. Lomerson, Rte. 9, Box 196, Fort Worth, Tex. 76179

Filed Feb. 15, 1977, Ser. No. 768,736
Int. Cl.[2] B41M 3/08; H05K 3/00
U.S. Cl. 29—625 **11 Claims**



1. A method for establishing an electrically conductive path on the surface of a passage through a non-conductive body which comprises forcing a mechanically spreadable and electrically conductive material as a solid in subdivided form into frictional contact with the walls of said passage to deposit a continuous layer of said material on said walls, said layer adherent to said body to form said conductive path.

6. A method for establishing an electrically conductive path through a non-conductive member, comprising the steps of:

(a) passing a cutting tool through said member to produce a passage therein;

(b) contacting said cutting tool with a body of mechanically spreadable and electrically conductive metal to produce metallic cuttings therefrom;

(c) transporting said metallic cuttings by means of said cutting tool into said passage; and

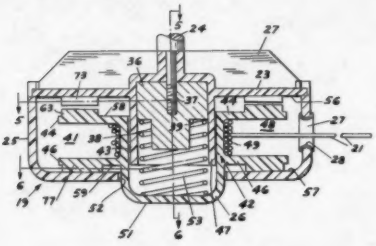
(d) smearing said metallic cuttings onto the walls of said passage by means of said cutting tool to form a continuous, electrically conductive layer on the walls of said passage.

4,183,138

APPARATUS FOR CUTTING VEGETATION

Albert W. Mitchell, and Donald M. Woods, both of Houston, Tex., assignors to Weed Eater, Inc., Houston, Tex.

Filed Mar. 8, 1978, Ser. No. 884,508
Int. Cl.[2] A01G 3/06
U.S. Cl. 30—276 **9 Claims**



1. An apparatus for cutting vegetation, comprising;

a. disc-like hub rotatable about an axis of rotation with an open face;

b. a cylindrical cover releasably secured to said hub and carrying a peripheral aperture;

c. said hub and cover carrying upper and lower planar clutch surfaces normal to the axis;

d. a spool journaled for rotation on said hub about said rotational axis and mounted between said hub and cover for axial movement against a biasing means from a first station to a second station, and said spool having upper and lower planar clutch surfaces normal to the axis;

e. a circular ball member operatively connected to said spool and mounted within said cover for axial movement therein, and said ball member extending at least partially from said cover to be accessible for manual activation;

f. at least one flexible non-metallic cutting line coiled on said spool and having a free end extending outwardly from said cover through said aperture into a cutting plane;

g. a plurality of uniform, angularly spaced straight teeth having planar surfaces normal to the axis carried on said upper and lower planar clutch surfaces of said spool, hub and cover;

h. said straight teeth on said clutch surfaces arranged in an overlapping relationship when said spool is moved intermediate said first and second station;

i. said straight teeth forming a locking means with interfitting radial alignment surfaces for the selective rotation of said spool to a predetermined angular displacement on said hub and cover by said ball member moving said spool between the first and second stations whereby a certain length of cutting line is extended from said cover into said cutting plane; and

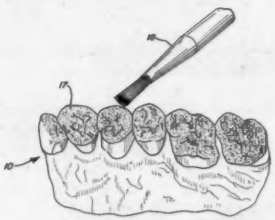
j. said teeth engaging each other and said clutch surfaces for aligning axially and radially said spool and said head with the axis.

4,183,139

METHOD OF MARKING DENTAL CONTACT POINTS

Asami Tanaka, 4840 Foster St., Skokie, Ill. 60077

Filed Jan. 19, 1978, Ser. No. 870,654
Int. Cl.[2] A61C 9/00
U.S. Cl. 32—19 **12 Claims**



1. A method of marking contact points on an occlusal surface of at least one pair of occluding teeth, said method comprising applying a predetermined number of transferable coatings of contrasting colors on predetermined areas of the occlusal surface of one tooth of the pair, and bringing the one tooth into occluding relation with the second tooth of the pair whereby portions of the previously applied coatings in the predetermined areas of the one tooth are transferred to corresponding predetermined areas of the occlusal surfaces of the second tooth of the pair only at the points of contact located in the corresponding predetermined areas of the second tooth, one of the corresponding predetermined areas of the second tooth occlusal surface including a cusp portion and a second of the corresponding predetermined areas of the second tooth occlusal surface including a fossa portion.

4,183,140

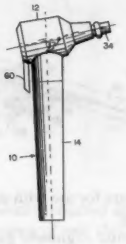
DENTAL STAIN REMOVER

Robert H. Rieselman, Clearwater, Fla., assignor to Concept Inc., Clearwater, Fla.

Continuation-in-part of Ser. No. 788,700, May 31, 1977, Pat. No. Des. 250,662. This application Mar. 2, 1978, Ser. No. 882,634

Int. Cl.[2] A61C *3/06*

U.S. Cl. 32—59 **9 Claims**



1. A dental instrument for removing stains from teeth comprising a housing comprising a drive casing forming a motor chamber and an electrically conductive handle casing removably mounted to said drive casing, said handle casing and said drive casing being assembled so that an angle formed by lines drawn through the axis of the drive casing and handle casing form an angle ranging from 95°–105°, motor means including a shaft mounted within said motor chamber and adapted to be seated therein, means to hold said motor means in a substantially fixed position within said motor chamber and seal said motor means from external elements, said motor holding and sealing means comprising a neoprene washer mounted on an annular stop formed by the drive casing in the interior of said motor chamber and a teflon seal mounted around said motor shaft adjacent said neoprene washer and extending beyond said annular stop to seal said motor casing from external contaminates, electrical power means comprises batteries mounted in said handle casing engaging said motor, a cap assembly secured to said drive casing, said cap assembly compromising a cap body and a lever extending from said cap body in the same direction as said handle casing extends from said drive casing, said lever containing an electrically conductive strip extending substantially along its length, said conductive strip being electrically connected at one end to said motor means, said lever being flexible and when activated by pressure being adapted to bend causing the other end of said conductive strip to engage said electrically conductive handle casing to complete a circuit activating said motor to rotate said shaft and dental stain remover means connected to said shaft.

4,183,141

METHOD AND APPARATUS FOR TREATING MALOCCLUSION

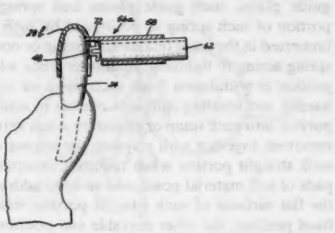
Eugene L. Dellinger, 1326 Old Lantern Tr., Fort Wayne, Ind. 46825, and Robert J. Loubier, 5122 Chippewa Ct., Fort Wayne, Ind. 46804

Filed Dec. 5, 1977, Ser. No. 857,373

Int. Cl.[2] A61C *7/00*

U.S. Cl. 32—66 **8 Claims**

1. Apparatus for locating a bracket in a predetermined position on the labial or buccal surface of a tooth comprising a rigid cap having an internal shape conforming to the crown portion of a tooth, a hollow guide element fixedly secured relative to said cap and having an elongated guiding portion which extends transversely to and outwardly from the labial or buccal surface of the tooth with said guiding portion having one open end in registry with and spaced from the aforesaid predetermined position, the distance said open end is spaced from said predetermined position being greater than the height of a bracket to be mounted, a bracket-carrying member slidably received for rectilinear movement by said guiding portion whereby said member may be moved into registry with said



predetermined position, and means on one end of said member for carrying a bracket and abutting the same against the tooth surface at said predetermined position.

4,183,142

SELF-RETRACTING MEASURING DEVICE WITH WIPING SYSTEM FOR OIL SUMPS AND OTHER CONTAINERS

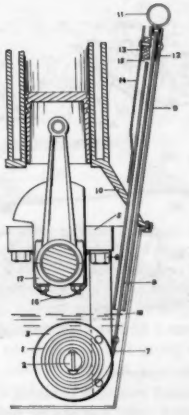
James R. Russell, Apt. 401 - 214 Agnes St., New Westminster, British Columbia, Canada (V3L 1E6)

Filed May 23, 1978, Ser. No. 908,737

Claims priority, application Canada, Nov. 23, 1977, 291603

Int. Cl.[2] G01F *23/04*

U.S. Cl. 33—126.7 R **4 Claims**



1. A device for measuring the level of oil in an engine sump of the fluid level in any other container of the type incorporating a dipstickcontaining tube or port leading to the exterior, comprising: a length of flat spring material in the configuration of a flat coil spring, its outer end straightened for a suitable length to act as a measuring unit, marked with a measuring scale, led to the exterior of such sump or container through such tube or port and capable of moving freely longitudinally through such tube or port; a handle attachable to such straightened outer end to extract such portion from such sump or container when required; a base structure comprising two parallel flat guide plates separated by an arbor immobilized between them by attachment of its ends to approximately their centres; a bracket attachable to one or both guide plates to immobilize them and attach them to an engine component within such sump or to the floor or side of such other container; the inner end of such coil spring affixed to the circum-

ference of such arbor perpendicularly to the axis of such arbor between such guide plates, such coil spring coiling loosely around such arbor and being loosely contained between such guide plates, such guide plates, coil spring and measuring portion of such spring so positioned by such bracket as to be immersed in the oil of fluid in such sump or container, such coil spring acting to tighten around such arbor when such straight portion is withdrawn from such sump or container by such handle, and exerting sufficient tension to retract such straight portion into such sump or container when extractive tension is removed; together with a system for wiping oil or fluid from such straight portion when required, comprising two wiping pads of soft material positioned so as to address themselves to the flat surfaces of such straight portion, one pad being in a fixed position, the other movable and positioned opposite the fixed pad, movable against a light spring and acting so that the flat surfaces of such straight portion may be compressed between such pads at will be pressure on the movable pad, such light spring capable of removing the movable pad away from the surface of the straight portion to which it is addressed when pressure on the movable pad is removed.

4,183,143

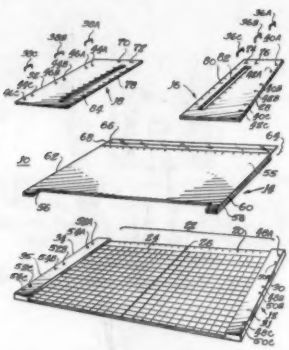
LETTERING GUIDE

Raymond C. Root, 10241 N. 143 St., Waverly, Nebr. 68462

Continuation-in-part of Ser. No. 834,476, Sep. 19, 1977, abandoned. This application Aug. 15, 1978, Ser. No. 933,966

Int. Cl.[2] B41B *1/00*

U.S. Cl. 33—184.5 **10 Claims**



1. Apparatus comprising:

first and second members mounted for movement with respect to each other and having right and left sides;

said first member including support means for supporting a medium upon which characters are to be transferred from transfer paper of the type having characters with transfer paper guide indicia beneath the characters;

said support means including a flat surface adapted to receive the medium upon which the characters are to be transferred;

said second member including slide means movably mounted to said support means;

said slide means including a guide edge;

said guide edge including a thin member with slide guide indicia upon it;

said guide member being sufficiently thin and said slide guide indicia being positioned so that the distance between the edge of the guide member and the slide guide indicia and the thickness of the guide member is less than the distance between the letter on the transfer paper and the nearest guide indicia underneath the character.

4,183,144

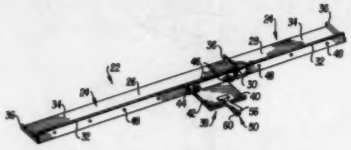
STRIP SHINGLE ALIGNMENT FIXTURES

Larkin H. Barnett, III, 4200 Flowerfield Rd., Norfolk, Va. 23518

Continuation-in-part of Ser. No. 709,683, Jul. 29, 1976, Pat. No. 4,056,889, which is a continuation-in-part of Ser. No. 610,727, Sep. 5, 1975, abandoned. This application Oct. 7, 1977, Ser. No. 840,431

Int. Cl.[2] G01B *3/30*

U.S. Cl. 33—188 **5 Claims**



1. An alignment fixture for use with strip shingles for roofing and siding, comprising:

an elongated horizontal alignment guide for simultaneously supporting the lower edges of a plurality of strip shingles to be laid;

clamping means for attaching said guide to a previously laid row of strip shingles in parallel relation thereto;

means joining said clamping means and said guide for permitting selectively adjustable horizontal movement of said guide relative to said clamping means while said clamping means is attached to said previously laid row, whereby said strip shingle to be laid may be properly positioned relative to said previously laid row without requiring removal of said clamping means from said previously laid row; and

horizontal stop means for positioning said guide and said strip shingles to be laid in a predetermined, staggered relation to said previously laid row of strip shingles; wherein said horizontal stop means comprises a pair of members each having an upstanding flange for having butt there against a vertical edge of one of said strip shingles to be laid and a base flange at essentially a right angle from the lower edge of the upstanding flange having a width wherein the width of the base flange is equal to the amount by which the shingles are to be staggered and said base flange further having a vertical edge opposite the lower edge of said upstanding flange for having butt there against an edge of another of said strip shingles to be laid.

4,183,145

METHOD OF SPRAY-DRYING LIQUID AND PASTELIKE MATERIALS AND INSTALLATION FOR CARRYING SAME INTO EFFECT

Georgy P. Piterskikh, ulitsa Garibaldi, 4, korpus 1, kv. 11; Stanislav A. Sukhov, Gostinichny pereulok, 4-a, kv. 71; Ivan I. Rumyantsev, ulitsa 8 Marta, 4, korpus 2, kv. 135; Lev L. Pavlovsky, ulitsa Kedrova, 20, kv. 33, and Ivan I. Frolikov, Petrozavodskaya ulitsa, 15, korpus 3, kv. 342, all of Moscow, U.S.S.R.

Filed Mar. 2, 1978, Ser. No. 883,157

Int. Cl.[2] F26B *3/08*

U.S. Cl. 34—10 **9 Claims**

1. A method of spray-drying liquid and pastelike materials in a combustion chamber having a exhaust means in communication with said chamber and spray means for introducing said materials into said chamber, said method comprising the steps

of: atomizating of liquid and pastelike materials; and subjecting the atomized material to the action of a shock wave, whereby,

atomizating of the material is effected at the point of the maximum energy characteristics of said shock wave.

4,183,146

PROCESS FOR SIMULTANEOUSLY DRYING MECHANICAL WOOD PULP AND IMPROVING MECHANICAL STRENGTH AND BRIGHTNESS OF THE PULP

Haruo Tsukamoto; Kazuo Koide; Yuzo Okazaki, and Isao Yamada, all of Tokyo, Japan, assignors to Oji Paper Co., Ltd., Tokyo, Japan

Filed Mar. 3, 1978, Ser. No. 883,208
Claims priority, application Japan, Jul. 19, 1977, 52/85612
Int. Cl.² F26B 7/00
U.S. Cl. 34—13.8 **11 Claims**

1. A process for simultaneously drying mechanical wood pulp fibers and improving the mechanical strength and brightness of said mechanical wood pulp fibers, comprising

(1) mechanically refining wood chips to prepare mechanical wood pulp;

(2) mixing said mechanical wood pulp with an aqueous solution of at least one sulfonating compound;

(3) adjusting the dry solids consistency of said mechanical wood pulp in said mixture to a level of from 20 to 50% by weight, and;

(4) bringing said adjusted mixture into contact with a drying gas heated to a temperature above 100° C. for a time sufficient to increase the dry solid consistency of said mechanical wood pulp in said mixture to a level of from 60 to 90% by weight.

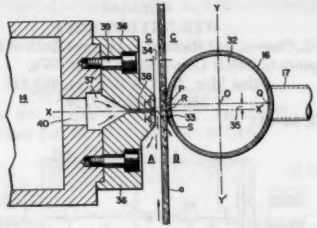
4,183,147

DEHYDRATION APPARATUS FOR FABRICS

Yukiyoshi Kawaguchi, Mukoh, Japan, assignor to Kabushiki Kaisha San Giken, Kusatsu, Japan

Filed Jan. 13, 1978, Ser. No. 869,328
Int. Cl.² F26B 5/04
U.S. Cl. 34—16 **17 Claims**

15. The method of drying fabric as a continuously moving web, including the steps of passing said web in tangential contact with an arcuate surface having the cross-sectional shape of a segment of a circle, directing a jet of high pressure air against a surface of the fabric at a first point offset upstream with respect to the fabric's direction of movement from said point of tangential contact, said surface of the fabric facing the jet being the one facing away from said arcuate surface, and applying a vacuum to said fabric on the surface thereof opposite from said jet for withdrawing liquids from the opposite



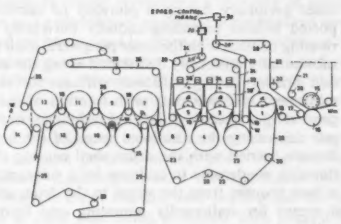
surface of the fabric at at second point closely adjacent to but offset upstream of said first point.

4,183,148

PAPER MACHINE DRYING SECTION AND METHOD OF OPERATING THE SAME

Erkki Koski, and Martti Koponen, both of Jyvaskyla, Finland, assignors to Valmet Oy, Finland

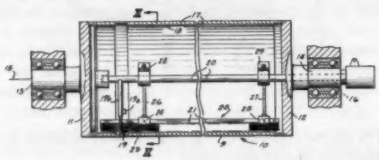
Filed Jul. 1, 1977, Ser. No. 812,043
Claims priority, application Finland, Jul. 5, 1976, 761953
Int. Cl.² F26B 3/00
U.S. Cl. 34—23 **15 Claims**



1. In a method of operating a paper machine drying section which includes a pair of staggered rows of rotary dryer cylinders which include a first group of cylinders of both rows which form an initial part of the drying section where a web is initially received from a press section to undergo an initial drying action, the steps of guiding around a sector of each of the cylinders in both rows of said first group a first endless fabric means which forms a closed loop, in a manner situating the cylinders of one of said rows of said first group within said loop to form inside cylinders therefrom and the cylinders of the other of said rows of said first group outside of said loop to form outside cylinders therefrom, while transporting a web which is to be dried along and around said cylinders of said first group by way of said first endless fabric means in a manner situating said web between said first endless fabric means and said outside cylinders in contact with the latter while situating said first endless fabric means between the inside cylinders and said web, said web being carried between cylinders in adjacent rows by said first endless fabric means, and pressing against said web only at portions thereof which lap said inside cylinders a second endless fabric means having a width substantially equal to that of said web for preventing said web from being displaced by centrifugal force outwardly away from said inside cylinders, and providing for said second endless fabric means a speed of travel according to which the portions of said second endless fabric means which lap said inside cylinders have an angular velocity substantially equal to the angular velocity of said inside cylinders, to avoid friction between said second

endless fabric means and said web as well as to avoid raising of dust from said second endless fabric means.

4,183,149
WEB DRYING ROLL
James L. Chance, and Richard E. Hergert, both of Rockton, Ill., assignors to Beloit Corporation, Beloit, Wis.
Filed Mar. 3, 1978, Ser. No. 883,127
Int. Cl.[2] F26B *3/24*
U.S. Cl. 34—41 **10 Claims**



1. In a hollow cylindrical dryer drum having an outer shell and mounted for rotation for drying contact with a traveling fibrous web, the combination comprising:

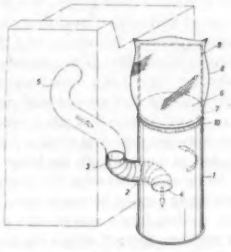
means connected to the drum for directing a flow of steam into the interior of the drum for heating the peripheral outer surface of the shell;

a condensate removal means within the drum for removing condensate from the inner surface of the periphery of the shell;

a bristle support within the drum extending axially along the inner periphery having a plurality of cantileverly supported bristles extending radially outwardly into close running contact with the inner peripheral shell surface and substantially uniformly distributed along the axial length; said bristles having sufficient stiffness for resisting the movement of condensate with rotation of the drum and generating a visual high level of turbulence in the condensate decreasing the rotational speed of the layer of condensate carried with the drum shell causing the layer of rimming condensate to collapse for a substantial increase in heat transfer from the steam to the drum shell;

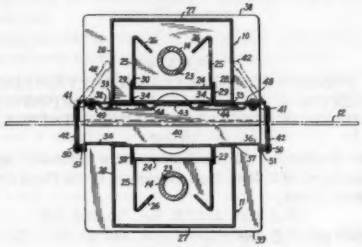
and means for stationarily mounting said bristle support within the drum.

4,183,150
ELECTRIC CLOTHES DRYER HEATER
Robert B. Nash, 4 Mays Ave., Hornell, N.Y. 14843
Filed Oct. 21, 1976, Ser. No. 734,402
Int. Cl.[2] F26B *21/06*
U.S. Cl. 34—86 **3 Claims**



1. An apparatus for heating and humidifying an enclosed space by utilizing the exhaust hot air and water vapor of an electric clothes dryer which comprises a cylinder shaped container having an entrance opening on its side and an exit opening on its top, a flexible conduit having an exit end attached sealingly to and passing through the container entrance opening, the opening of the conduit exit end being directed to the bottom of the container and having an entrance end capable of fitting securely over the exhaust of the clothes dryer, a plurality of wire loops attached to the container traversing the container exit opening and a means for filtering air and water vapor covering the container exit opening, attached to the container and supported by the wire loops.

4,183,151
HIGH PRODUCTION STEAMER FOR TUBULAR KNITTED FABRIC OR THE LIKE
Robert Frezza, New York, N.Y., assignor to Samcoe Holding Corporation, Woodside, N.Y.
Filed Nov. 3, 1977, Ser. No. 848,101
Int. Cl.[2] D06B *3/20*
U.S. Cl. 34—155 **12 Claims**



1. A high production processing steamer for tubular knitted fabrics or the like, comprising

(a) a path of conveyance for the fabric being disposed in a generally horizontal processing plane,

(b) a pair of steam boxes mounted in opposed relation above and below the processing plane,

(c) said steam boxes having steam discharge openings at one side thereof in close proximity to and extending across the width of the fabric and arranged to direct steam toward the fabric from above and below,

(d) wall-forming means associated with and located near the discharge side of each steam box and extending in the upstream and downstream directions of the path of conveyance in planes above and below the processing plane,

(e) said planes above and below the processing plane each being generally parallel to and in close proximity to said processing plane, and

(f) each of said steam boxes includes transversely elongated end plates sealing the outer ends thereof and extending in planes at a large angle to the processing plane on either side of the path of conveyance,

(g) each of the end plates of the steam box above the processing plane being in a close-fitting relation to the complementary end plates of the steam box below the processing plane to form walls extending close to and on either side of the path of conveyance,

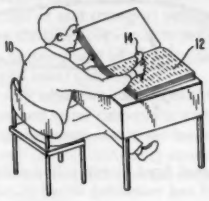
(h) each of the end plates contacting at least a portion of at least one of said wall-forming means to define continuous, enclosing wall structures,

(i) whereby said wall-forming means and said end plates are arranged and configured to form a chamber to confine steam ejected from the steam boxes to a limited region closely surrounding the fabric.

4,183,152
ELECTRICAL INDICATING DEVICE

John F. Harris, III, Franksville, Wis., assignor to Western Publishing Company, Inc., Racine, Wis.

Filed Jun. 29, 1978, Ser. No. 920,516
Int. Cl.[2] G09B 7/06
U.S. Cl. 35—9 C 1 Claim

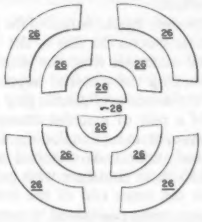


1. An electrical indicating device comprising:
a casing member having a first portion and a second portion, said first and second portions cooperating to define a substantially enclosed chamber, said casing member configured to provide an owl configuration;
a printed circuit board within said chamber and fastened to one of said portions;
a pair of light emitting diodes mounted within said chamber and visible through one of said portions to form the eyes of the owl;
an electrically conductive elongated cylindrical tube member fixedly mounted on said printed circuit board and extending through said casing member;
an electrically conductive elongated cylindrical pin member positioned within said tube member;
an electrically insulating elongated cylindrical sleeve member surrounding said pin member and within said tube member to insulate said pin member from said tube member;
spring means biasing said pin member outwardly from said tube member; and
a solid state amplifier circuit mounted on said printed circuit board and electrically connected to said light emitting diodes, to said sleeve member and to said pin member and responsive to electrical interconnection of said sleeve member and said pin member to energize said light emitting diodes.

4,183,153
HYPERBOLIC GEOMETRY MODEL

Lawrence J. Dickson, 12550 Greenwood N., #304, Seattle, Wash. 98133

Filed Oct. 26, 1977, Ser. No. 845,495
Int. Cl.[2] G09B 23/04
U.S. Cl. 35—34 5 Claims

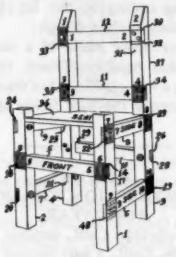


1. A hyperbolic geometry model comprising a plurality of flexible annular strips arranged about a center point with the inner edges of said strips joining the outer edges of inwardly adjacent strips, and the side edges of said strips joining the side edges of laterally adjacent strips to form a continuous loop, the radius of curvature of said inner and outer edges being progressively increased away from said center point such that each of said strips correspond to and resemble an annulus of the hyperbolic plane.

4,183,154
INSTRUCTIONAL CHAIR

Earl R. Dykes, Rte. 4, Box 74, Lake City, Fla. 32055

Filed Jul. 25, 1978, Ser. No. 927,896
Int. Cl.[2] A63H 33/04
U.S. Cl. 35—73 10 Claims

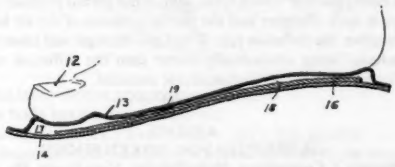


1. A bolted together disassemblable and reassemblable instructional furniture article comprising a plurality of upright post members and a plurality of generally horizontal rail members, each said rail having end lap joint portions meeting corresponding predetermined respective joint portions of said post members and forming respective lap joints therewith, at least some of said joint portions of said posts being provided with respectively visually distinguishable coding indicia and the ones of said end portions of said rail members which respectively meet said joint portions of said posts being provided with respectively matching visually distinguishable coding indicia, the respective rail end lap joint portion and the post joint portion at each joint being provided with aligned bolt openings, bolts fittingly received in said openings for stabilizing said joints, at least several of said joints differing from each other in the numbers and sizes of said openings and bolts.

4,183,155
INSOLE FOR FOOTWEAR HAVING FLEXIBLE ENVELOPE MEANS

William H. Payne, Rte. 9, Box 418, Meadville, Pa. 16335

Filed Aug. 18, 1978, Ser. No. 934,899
Int. Cl.[2] A43B 13/40, 13/41
U.S. Cl. 36—44 1 Claim



1. An insole (10) comprising,
a flexible envelope (11) adapted to extend substantially the entire length and width of the wearer's foot (12) having an upper wall (13) adapted to engage the underside of the wearer's foot (12) and the lower wall (14) coextensive with and connected at the marginal edges of the upper wall (13) providing a relatively rigid border around said

upper member and said lower member forming an envelope with longitudinally extending wrinkles therein,

a relatively thin flat rigid inner member loosely received in said envelope between said upper wall and said lower wall and being slightly narrower and slightly shorter than the envelope and narrower than the wearer's foot,

the area of said upper wall being substantially wider between the marginal edges than the lower wall whereby said upper wall wrinkles and slides on the inner member when the wearer walks providing a massaging action for the wearer's foot,

the material of said upper member and said lower member being made of a rubbery like material on the outside with a fabric backing resting on the flat rigid inner member providing a sliding surface design,

said inner member being made of a material having the properties of thin rigid cardboard, the flat rigid inner member having a low coefficient of friction relative to the upper wall whereby the foot freely slides on the inner member.

4,183,156

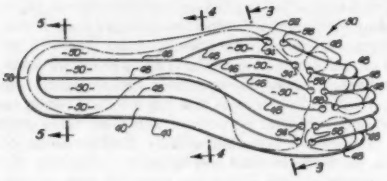
INSOLE CONSTRUCTION FOR ARTICLES OF FOOTWEAR

Marion F. Rudy, Northridge, Calif., assignor to Robert C. Bogert, Woodland Hills, Calif., a part interest

Continuation-in-part of Ser. No. 759,429, Jan. 14, 1977, abandoned. This application Sep. 6, 1977, Ser. No. 830,589

Int. Cl.[2] A43B *13/38, 13/20;* **A61N** *0/00*

U.S. Cl. 36—44 **45 Claims**



1. An inflated insert construction for articles of footwear, comprising a sealed insert barrier member of permeable elastomeric material providing a plurality of chambers, said chambers being inflated with a gaseous medium under pressure to a desired initial value, said gaseous medium in said chambers comprising a gas other than air, oxygen or nitrogen, said elastomeric material having characteristics of relatively low permeability with respect to said gas to resist diffusion of said gas therethrough from said chambers and of relatively high permeability with respect to the ambient air surrounding said insert to permit diffusion of said ambient air through said elastomeric material into each of said chambers to provide a total pressure in each chamber which is the sum of the partial pressure of the gas in each chamber and the partial pressure of the air in each chamber, the diffusion rate of said gas through said elastomeric material being substantially lower than the diffusion rate of nitrogen through said elastomeric material.

4,183,157

OVERSHOES FOR SPIKED SHOES

Clarence J. Counselman, 10 Sailfish Dr., Vero Beach, Fla. 32960

Filed Oct. 30, 1978, Ser. No. 955,928

Int. Cl.[2] A43B *5/00*

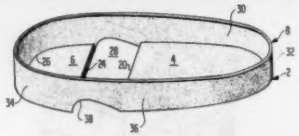
U.S. Cl. 36—135 **3 Claims**

1. An overshoe for covering the sole of a shoe having a plurality of spikes protruding therefrom which comprises

a front sole portion

a rear heel portion separate from said front sole portion, said sole and heel portion being formed of resilient sheet material having a thickness between about 10 to 20 mm. and a Shore type A Durometer of between about 20 to 45,

strips of elastomeric material having a thickness between about 1 to 2 mm. fixed to the sides of said sole portion and said heel portion and bridging the separation therebetween,



a strip of material fixed to said sole portion along the front edge thereof and extending above its top surface to provide means to engage the toe of a shoe and

a strip of material fixed to said heel portion along the rear edge thereof and extending above its top surface to provide means to engage the heel of a shoe.

4,183,158

CONVEYOR FOLDING AND DEFLECTOR OPERATION FOR EXCAVATING AND LOADING SYSTEMS

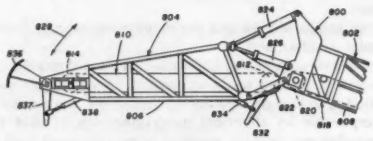
Charles R. Satterwhite, Dallas, Tex., assignor to Unit Rig & Equipment Co., Tulsa, Okla.

Division of Ser. No. 658,860, Feb. 18, 1976, Pat. No. 4,069,605, which is a division of Ser. No. 554,671, Mar. 3, 1975, abandoned, which is a continuation-in-part of Ser. No. 238,089, Mar. 27, 1972, abandoned. This application Aug. 5, 1977, Ser. No. 822,206

The portion of the term of this patent subsequent to Jul. 29, 1992, has been disclaimed.

Int. Cl.[2] E02F *3/24*

U.S. Cl. 37—190 **3 Claims**



1. An excavating and loading system comprising:

a vehicle having a front and rear;

an excavating wheel mounted on the front of the vehicle for excavating material;

main conveyor means for receiving the excavated material from the excavating wheel and for transporting the material to the rear of the vehicle;

a drive mechanism mounted on the vehicle for operating the excavating wheel;

an auxiliary conveyor means mounted for pivotal movement about a vertical axis on the rear of the vehicle for receiving excavated materail from the main conveyor means and for conveying the material beyond the rear of the vehicle and for selectively discharging the materail into either one of a pair of material transport vehicles, said auxiliary conveyor means including an inner conveyor with inner and outer ends attached to the rear of the vehicle, and an outer conveyor with inner and outer ends positioned at the outer end of the inner conveyor, the inner conveyor being positioned to extend upwardly and outwardly beyond the rear of the vehicle a sufficient distance to discharge excavted material directly into one of said transport vehicle positioned behind the excavating and loading system;

means connecting the outer conveyor to the outer end of the inner conveyor for movement between a material receiv-

ing position wherein excavated material discharged from the outer end of the inner conveyor is discharged onto the inner end of the outer conveyor and is transported by the outer conveyor for discharge into one of said transpfort vehicles, and an inoperative position wherein the inner end of the outer conveyor is positioned spaced away from the outer end of the inner conveyor so that excavated material discharged from the inner conveyor is free to fall into the other one of said transport vehicles therebelow;

means connecting the outer conveyor to the inner conveyor for selectively pivoting said outer conveyor to a position folded under said inner conveyor;

means for selctively adjusting the angular relationship between the inner and outer conveyors; and

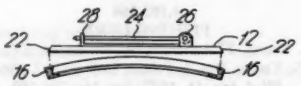
deflection plate means positioned at the inner and outer ends of the outer conveyor for deflecting material respectively from the inner conveyor and from the outer conveyor into the transport vehicles.

4,183,159

PORTABLE TRANSPARENT DISPLAY DEVICE

Mark Isaac, 1894 Alberni St., Vancouver, B. C., Canada

Filed Nov. 21, 1977, Ser. No. 853,242
Int. Cl.² A44C 3/00
U.S. Cl. 40—1.6 **7 Claims**



1. A portable transparent display device comprising:

a flexible, plastic, transparent generally flat receiving element having a front face and rear face, a recessed space on the rear face thereof, said recessed space having a planar bottom surface presented towards the front face thereof and an outer periphery defined by a continuous smooth inclined interior wall extending and inclined in a direction away from the planar bottom surface and towards the center of said element;

a generally flat insertable element shaped and dimensioned to be received as a close interference fit by the recessed space of the receiving element and having a continuous smooth outer slanting wall mating with and removably retained by the said smooth inclined interior wall of the recessed space of the receiving element;

the thickness of the insertable element corresponding substantially to the depth of said recessed space;

the receiving element being resiliently deformable out of its generally flat condition to draw the periphery of said recessed space on the rear face thereof forwardly relative to the planar bottom surface of said recessed space so that the inclined interior wall of said recessed space clears the outer slanting wall of said flat insertable element to release it from retention therein;

said display device having attachment means affixed to and protruding rearwardly from the flat insertable element for use in attaching said assembled device to an external object;

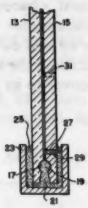
the insertable element having an acute angled, sharp peripheral edge for disposition adjacent to the bottom surface of the recessed space of the receiving element, said sharp edge co-operating with the peripheral edge of the recessed space on assembly of the receiving element and the insertable element, to cut paper material disposed therebetween.

4,183,160

EVACUATED MOUNT FOR DISPLAY OBJECTS

Hardy G. Brodersen, Birmingham, Mich., assignor to Brokenspar Inc., Birmingham, Mich. and George Vihos, New York, N.Y.

Filed Feb. 27, 1978, Ser. No. 881,540
Int. Cl.² G09F 1/12
U.S. Cl. 40—152 **11 Claims**



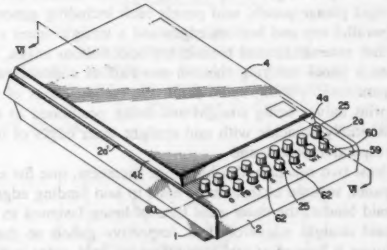
1. A mount for thin flexible display objects including drawings, large drawings, paintings, thin sheets, rare documents, old manuscripts, historic flags, tapestries, artifacts, or other large thin sheets; comprising a pair of opposed rectangular flexible plastic sheets arranged face to face adapted to receive a display object therebetween; at least one of said sheets being transparent; said sheets having continuous opposed peripheral inner wall portions; said wall portions having opposed peripheral recesses therein, defining a peripheral cavity; and a sealant filling said cavity throughout 360° for securing and sealing together said peripheral wall portions; the space between said sheets being evacuated, with said display object operatively, snugly and protectively held and sealed in a single plane between said sheets.

4,183,161

INDEX DEVICE

Chuzo Mori, Tateishi, Japan, assignor to Carl Manufacturing Co., Ltd., Tokyo, Japan

Filed Feb. 22, 1978, Ser. No. 880,127
Int. Cl.² B42F 17/20, 17/34
U.S. Cl. 40—389 **11 Claims**



1. An index device comprising

(a) a body having a card support;

(b) a cover having a front portion and a rear portion;

(c) means pivotally mounting the rear portion of the cover on a rear portion of the body for pivotal movement between an open position and a closed position with respect to the body;

(d) a stack of cards on said card support and between said body and said cover;

(e) an ear at the tip of each card of said stack, said ears of the respective cards having an essentially constant laterally staggered pitch and being exposed toward the body to

form an inverted step-like array when the cards are stacked in the body;

(f) selectively operable means for engaging the ear of a predetermined card to initially push the predetermined card, and cards of the stack between the predetermined card and the cover, toward the cover;

(g) stop means on one side of said cover for engaging the stack to cause the initially pushed cards of the stack to bend so that the pushed predetermined card is effectively separated from the next adjacent card of the unpushed remainder of the stack; and,

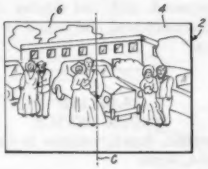
(h) card holding means on said cover in spaced relation to said stop means for holding the initially pushed cards for movement with the cover to its open position, when the cover is opened.

4,183,162

PANORAMIC PHOTOGRAPH ALBUM, AND METHOD FOR MAKING THE SAME

Melvin Applebaum, Flushing; Len De Pas, Woodhaven, and William C. Little, Bronx, all of N.Y., assignors to Barkley Studios, Inc., Forest Hills Gardens, N.Y.

Filed May 17, 1977, Ser. No. 797,829
Int. Cl.[2] G09F *13/00*
U.S. Cl. 40—530 **6 Claims**



1. A photograph album, including:

a binder, said binder having a binding edge;

at least a pair of generally rectangular, substantially flat and rigid planar panels, said panels each including generally parallel top and bottom edges and a straight inner edge that extends normal to said top and bottom edges, and each panel carrying thereon one-half of a double-wide panoramic photographic print, the mating edges of said print halves being straight and being positioned to substantially coincide with said straight inner edges of their respective panels; and

at least two separate, flexible hinge members, one for each panel, secured at their inner ends to said binding edge of said binder, the outer ends thereof being fastened to the said straight edges of their respective panels so that a hinge is formed at said straight edges, said outer ends of said hinge members extending underneath the mating edge portions of their respective print halves,

said hinge members having a dark color tone which generally blends with the color tones of the central portion of the print carried by said panels so as to present an unobtrusive appearance, and extending for substantially the full length of said inner edges of said panels, and

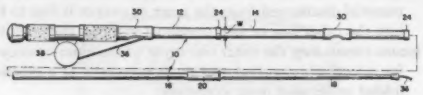
said planar panels lying in a common plane when open and having a narrow gap between the straight inner edges thereof, whereby they can be pivoted between closed and open positions without damaging said straight inner edges and said mating edges of said print halves.

4,183,163

VERSATILE COLLAPSIBLE FISHING ROD

Paul Reimer, 29 McLoughlin St., Glen Cove, N.Y. 11542

Filed Aug. 22, 1977, Ser. No. 795,214
Int. Cl.[2] A01K *87/00*
U.S. Cl. 43—24 **5 Claims**



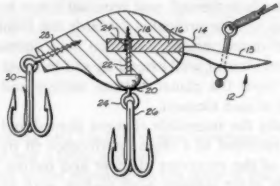
1. In a versatile fishing rod collapsible upon itself for storage or telescopically extendible for use including a plurality of tapered hollow sections, a first butt section, a second section, a third section, and a fourth tip section, a reel with line affixable to said butt section the improvement which comprises providing a double wall construction in a generally central position in at least said butt section and a reinforced elongated line intake opening through said double wall leading into the hollow of said butt section, said line passable through said line intake opening and emergable at an opening in the end of said fourth tip section, and wherein a removable handle is provided for said second and third sections and a double wall construction is provided in a generally central position in said second section and a reinforced elongated line intake opening through said double wall leading into the hollow of said second section, said line passable through said line intake opening and emergable at said opening in said end of said fourth tip section.

4,183,164

FISHING LURE

Walter M. Young, 27 Anderson St., Piedmont, S.C. 29673, and Robert S. Young, Rte. 1, Pelzer, both of S.C. 29669

Filed Apr. 11, 1977, Ser. No. 786,650
Int. Cl.[2] A01K *85/00*
U.S. Cl. 43—42.09 **3 Claims**



1. A fishing lure comprising a body of buoyant material having a generally fish shape with a front head portion and a rear tail portion,

an elongated hole extends into said front head portion, said elongated hole being defined by walls which intersect each other at sharp angles,

a lip member having:

(a) an enlarged planar forward surface,

(b) an elongated shank portion corresponding in shape with said elongated hole for providing a tight fit therebetween, said shank portion having surfaces of substantially the same width intersecting each other at complementary angles to the sharp angles of said elongated hole so as to prevent said shank portion from turning in said hole, and

an intermediate portion interposed between said planar forward surface and said elongated shank portion,

said intermediate portion having an arcuate forward surface conforming with the curvature of said front head portion of said lure, and a substantially planar vertically extending rear surface,

said elongated shank portion being integral with and extending rearwardly from a medial portion of said planar vertically extending rear surface,

an elongated screw member extends through the body of said lure and said shank portion for securing said lip member to said body,

an eye carried on end of said screw member, and

a hook secured to said eye.

4,183,165

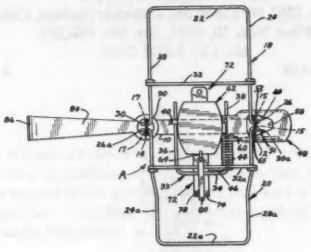
ANIMAL TRAP

Kenneth Swanson, R.R. #1, Waverly, Minn. 55390

Continuation of Ser. No. 653,098, Jan. 28, 1976, abandoned. This application Aug. 1, 1977, Ser. No. 820,862

Int. Cl.[2] A01M *23/26*

U.S. Cl. 43—88 **2 Claims**



1. An animal trap comprising:

(a) an elongated base,

(b) first and second jaws each having spaced substantially parallel legs of identical length joined at the outer free ends by a

(c) straight base bar normal to said legs,

(d) the straight base bar of said second jaw being of less length than said straight base bar of said second jaw,

(e) each of said legs of said jaws being formed arcuately inwardly towards the other jaw and the legs of said second jaw shorter than those legs of said first jaw whereby the cross bar of said second jaw bypasses the cross bar of said first jaw to thereby cause the jaws to substantially engage the full body of the animal to be trapped,

(f) a cross bar connected to said spaced legs intermediate the outer and inner ends thereof and parallel to said base bar,

(g) means pivotally mounting each of said legs at the inner ends to said base,

(h) a pressure trip plate pivotally mounted on

(i) a base cross bar mounted on said base and normal thereto

(j) a catch notch member carried by said trip plate,

(k) a catch bar pivotally mounted at one end on said cross bar

(l) a U-shaped support having a base portion from which extends spaced right angular parallelly disposed legs mounted on and extending from said base at a right angle thereto,

(m) a setting plate pivotally mounted on one leg of said U-shaped support,

(n) said setting plate having an opening therein and through which a leg of each jaw extends,

(o) a coil spring mounted on one of said legs of said U-shaped support and having first and second free end legs,

(p) said first free end leg of said spring engaged under said base cross bar and

(q) said second free end leg of said spring engaged under said setting plate adapted to urge said setting plate upwardly against a leg of each of said jaws to urge said jaws in clamping relationship and allow said jaws to be opened when said setting plate is depressed towards said base against the urging of said spring, said jaws held in a spread apart condition by said catch bar positioned over a cross bar of one of said jaws and in engagement with said catch notch of said trip plate and said jaws released to clamping position by a pressure exerted upon said trip plate whereby said catch bar is released from said catch notch to allow said second free end of said coil spring to pivotally move said setting plate upwardly against a leg of each of said jaws.

4,183,166

ARTICULATED TOY

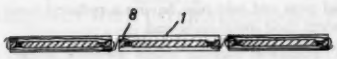
Alfred Borner, Pickliessemer Str. 3, 5521 Dudeldorf, Fed. Rep. of Germany

Filed Oct. 12, 1977, Ser. No. 841,646

Claims priority, application Fed. Rep. of Germany, Oct. 27, 1976, 2648696

Int. Cl.[2] A63H *33/00, 15/00*

U.S. Cl. 46—1 R **1 Claim**



1. In a toy comprising shaped tablets which are able to move under gravitational influence and which are connected uninterruptedly together by tapes to be able to move in such a way that, if a first said tablet is taken hold of and the other tablets are allowed to hang free, then one face of said tablets is visible, and, if said first tablet is turned down in front of the tablet next below it, then all the tablets which are not held automatically turn over, after which the other face of the tablets is visible, said toy comprising a plurality of tapes of equal length each having thickened end-pieces composed of resilient plastic material which is injection molded onto said tapes, each said tablet having opposite narrow ends and cut-out portions extending through said tablets adjacent each said end with each said cut-out portion having an enlarged area adjacent one surface and a smaller area adjacent the opposite surface of said tablet, said end-pieces being of resilient material and interengaged within said cut-out portions of said tablets and with said tapes extending from said smaller area of said cut-out portions, the cut-out portions at one end of each tablet having the smaller area on one surface thereof while the cut-out portions at the opposite end of said tablet having the smaller area on the opposite surface thereof.

4,183,167

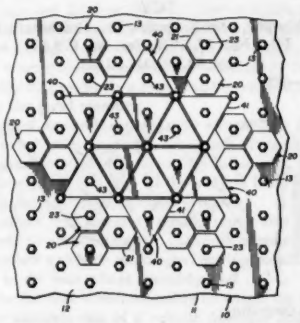
THREE DIMENSIONAL TOY

Michael Jatich, 2127 Tyrone St., Akron, Ohio 44312

Filed Mar. 10, 1978, Ser. No. 885,451

Int. Cl.[2] A63H *33/08*

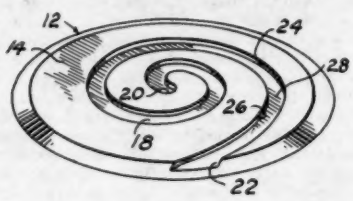
U.S. Cl. 46—16 **3 Claims**



1. A design toy, comprising;

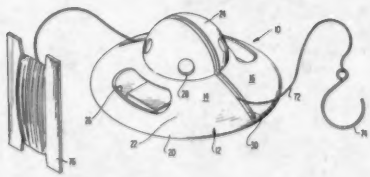
(A) a generally planar board:
(B) a plurality of registry pegs
(1) projecting from one face of said board and
(2) having a hexagonal cross-section;
(C) a plurality of playing pieces each having
(1) a single recess opening into one surface and having a hexagonal cross-section and
(2) a single pin projecting from an opposed surface and having a hexagonal cross-section
(3) said playing pieces having a variety of planar configurations including hexagonal, triangular and circular;
(4) at least some of said triangular pieces have the points at the corners thereof truncated whereby they will not interfere with said pegs of said board;
(D) said pegs are disposed in 60° relationship to each other so that a line interconnecting the mid-points of any three pegs in more than one row forms an equilateral triangle where two pegs lie in one row and the third lies on a line splitting the distance between the first two;
(E) said pegs and said pins having a reduced cross section adjacent their distal ends; and
(F) said playing pieces have different colors.

4,183,168
FLYING DISK TOY
Roger E. Ross, 1015 Sycamore, Iola, Kans. 66249
Filed Sep. 14, 1978, Ser. No. 942,211
Int. Cl.[2] A63H *27/12, 27/00*
U.S. Cl. 46—60 **3 Claims**



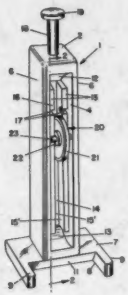
1. A flying disk toy, comprising:
a disk having opposing flat surfaces and having an elongated spiral groove formed in one said surface beginning near the center of said disk and terminating at the perimeter of said disk; and,
means for launching said disk into the air comprising a crank having a rotatable head at one end coacting with said groove and having a handle journalled by its other end portion.

4,183,169
TOY
William F. Murphy, 1209 Ridgeview Dr., Greensburg, Pa. 15601
Filed Feb. 17, 1978, Ser. No. 878,647
Int. Cl.[2] A63H *21/02*
U.S. Cl. 46—100 **4 Claims**



1. A toy comprising:
a body housing having an upper body section and a bottom wall;
a pair of sleeve members fixedly secured on said wall in lateral spaced apart relationship;
a pair of upright axle support members each having a base and an opening therein;
weight means comprising an elongated weight member engaged in said sleeve members, and extending through said upright axle support member opening;
an axle spanning the axle support members and a pulley wheel rotatably mounted on said support members;
said upper body section having a longitudinally extending slot formed therein, said pulley wheel being in alignment with said slot; and
an elongated cord member entering through said slot and under the wheel, whereby the wheel will ride thereon.

4,183,170
TOY WHEEL RUNWAY
Rex L. Lytle, 2307 W. Kiowa St., Colorado Springs, Colo. 80904
Filed Nov. 10, 1977, Ser. No. 850,203
Int. Cl.[2] A63H *5/00*
U.S. Cl. 46—114 **4 Claims**



1. A toy runway comprising an elongated hollow body member having closed upper and lower ends, a rear wall, and an open front, a flat base for said member, handle means at the upper end thereof with knob means thereon, an elongated slot in said rear wall, spaced parallel flat rib track means in said hollow body member arranged adjacent to said slot, said upper and lower ends of said hollow body being curved upwardly and outwardly and downwardly and outwardly, respectively, and a wheel having a hub and axle means thereon, said rib track means having notches adjacent the upper ends thereof, said wheel being positioned relative to said track means with the axle means thereon and arranged and retained in said notches, whereby when the flat base of said body member is tilted at an angle relative to a flat surface and said wheel is released and freed from said notches it will gravitationally descend on said rib track means and be ejected from the lower end of said body member.

4,183,171
CHANGEABLE FIGURE TOY
Rouben T. Terzian, Chicago, Ill., assignor to Marvin Glass & Associates, Chicago, Ill.
Filed Feb. 10, 1978, Ser. No. 876,412
Int. Cl.[2] A63H *11/00*
U.S. Cl. 46—119 **7 Claims**

1. A doll for simulating pregnancy, comprising:
a torso including a front abdominal opening;
limb members simulating arms and legs secured to said torso;
a head member secured to said torso;
a cam assembly mounted within said torso for simulating pregnancy upon actuation, said cam assembly including a cam pivotally mounted within said torso, said cam includ-

ing a convex-shaped side portion position adjacent said opening; and

a bi-stable spring positioned in the upper torso portion, said spring being secured to said cam assembly and accessible

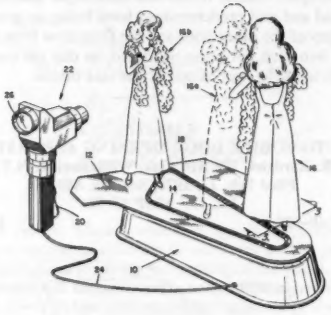
for manual actuation to move the cam from a first stable position maintaining said side portion within said opening to a second stable position maintaining said side portion in a position extending through said opening to thereby simulate pregnancy.

4,183,172

TOY WITH ENDLESS BELT FOR CONVEYING A DOLL OR THE LIKE

J. Stephen Lewis, Pacific Palisades, and Jurgis Sapkus, Manhattan Beach, both of Calif., assignors to Mattel, Inc., Hawthorne, Calif.

Filed Sep. 16, 1977, Ser. No. 833,758
Int. Cl.[2] A63H *11/00*
U.S. Cl. 46—122 **9 Claims**



1. In a toy for supporing and conveying a doll or the like, the combination comprising:

a housing having a platform, the housing being configured for supporting the platform generally parallel to a supporting surface;

channel means within said housing in proximity to said platform, said channel means defining a closed loop path;

a continuous endless belt drive member within said channel means;

slot means within said platform in spaced aligned relation with said drive member;

a carrier rotatably coupled to said drive member beneath said platform for supporting a doll or the like above said platform, said carrier including a gear portion and a cam device;

rack means within said channel means positioned for meshingly engaging said gear portion for rotating said carrier;

first and second sets of equally spaced cam members within said channel means on opposite sides of said drive member, one set of said cam members being displaced from the other set in the direction of travel of said drive member a distance of approximately one-half the spacing, said cam device being so configured and so positioned for alternately engaging said cam members for oscillating said carrier during movement of said drive member; and

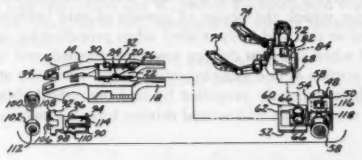
reversable drive means coupled to said drive member, said cam device being further configured for engaging the first of said cam members in the reverse direction of travel to rotate said carrier approximately one-half turn for rotating a so-supported doll to face in the opposite direction.

4,183,173

TOY ASSEMBLY WITH INTERCHANGEABLE PARTS AND DETACHABLE APPENDAGES

Iwakichi Ogawa, Kashiwa, Japan, assignor to Takara Co., Ltd., Tokyo, Japan

Filed Mar. 28, 1978, Ser. No. 890,919
Int. Cl.[2] A63H *33/10*
U.S. Cl. 46—202 **3 Claims**



1. A combination toy vehicle and doll assembly comprising:

a vehicle body member having a plurality of retaining grooves;

a front wheel assembly operatively attached to the vehicle body member, including a base plate, a cantilevered support plate extending from the base plate, retaining means on the support plate, a pawl member, a pair of wheels and an axle interconnecting the wheels;

alignment means complimentarily positioned on the base plate relative to the retaining means to operatively position the axle for rotatable support of the vehicle body member, the retaining means on the cantilevered support plate comprising a protrusion projecting downward from the support plate whereby the front wheel assembly is capable of snappingly receiving and holding the axle interconnecting the wheels, the alignment means complimentarily positioned on the base plate comprise a plurality of prongs and the base plate further comprises a pair of protrusions positioned underneath the axle interconnecting the wheels and projecting outward to prevent sliding of the wheels along the axle and wherein the front wheel assembly is operatively attached to the vehicle body member by the pawl member;

a rear wheel assembly operatively attached to the vehicle body member and having a base plate of complimentarily configuration to the retaining grooves, the rear wheel assembly being attached to the vehicle body member by sliding the base plate into the grooves;

an articulated doll assembly having removable appendages attached to a trunk member, the trunk member configured to simulate a vehicle engine and having means for attachment to the rear wheel assembly, and

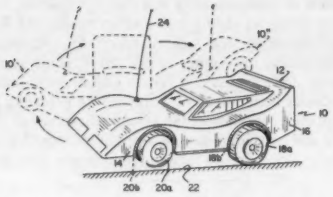
means on the rear wheel assembly to attach the doll assembly to simulate one of a vehicle operator and an engine whereby the child has a plurality of toy options.

4,183,174

TOY STUNT VEHICLE

George Barris, 10811 Riverside Dr., North Hollywood, Calif. 91602, and Leslie Turbowitz, 175 Prospect St., East Orange, N.J. 07016

Filed Jun. 22, 1978, Ser. No. 917,808
Int. Cl.[2] A63H *30/04*
U.S. Cl. 46—254 5 Claims



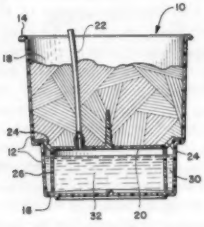
1. A stunt vehicle comprising a vehicle body having a forward portion and a rearward portion; a pair of wheels rotatably mounted to the rearward portion of said body; motor drive means coupled to one of said wheels for driving said one wheel with a selected torque, the other wheel being free to idle; and control means coupled to said motor drive means for actuating said motor drive means to provide a selected one of a first driving torque and a greater second driving torque to said one wheel; the center of gravity of said vehicle being located so that said body is level when propelled by said one wheel when said first driving torque is selected, and the forward portion of said vehicle body is raised upwardly and said vehicle is circularly propelled by said one wheel about said other wheel when said second driving torque is selected.

4,183,175

SELF-WATERING APPARATUS FOR GROWING PLANTS

Bervin W. Magee, 416 N. 4th Ave., Maywood, Ill. 60153

Filed Nov. 3, 1976, Ser. No. 738,480
Int. Cl.[2] A01G *27/00*
U.S. Cl. 47—79 20 Claims



1. A method of maintaining a plant comprising:

providing an upper soil zone, a high humidity air zone and a water zone wherein a relatively mature root extends from said soil zone, through said high humidity air zone, into said water zone to absorb water directly from said water zone, and wherein the high humidity air zone is substantially isolated from the ambient atmosphere and the water zone is in fluid communication with a reservoir of water with a greater water holding capacity than said water zone; and

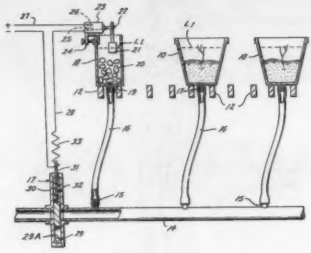
periodically supplying said reservoir with water.

4,183,176

SYSTEM FOR SUPPLYING LIQUIDS TO POTTED PLANTS

William G. Barfield, 137 Tropical La., Corpus Christi, Tex. 78408

Continuation of Ser. No. 786,108, Apr. 11, 1977, abandoned.
This application Jul. 12, 1978, Ser. No. 923,809
Int. Cl.[2] A01G *27/00*; F16K *31/18*
U.S. Cl. 47—79 4 Claims



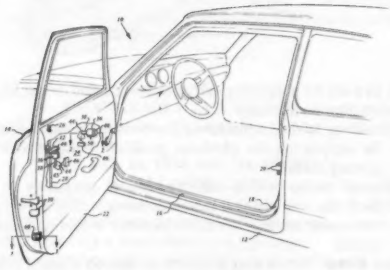
1. A system for wetting plants, comprising pots for the plants each having a hole in its lower end, a control pot also having a hole in its lower end, means for supporting the pots on generally the same level, means for sensing the level of liquid within the control pot, a main distribution conduit connected to a source of liquid which remains under relatively constant pressure upon use in the system, a plurality of feeder conduits each extending from the main conduit for releasable fluid connection with the hole in an individual pot, valve means in the main conduit intermediate said liquid source and said feeder conduits, means for automatically moving the valve means to and maintaining it in fully open position to permit said liquid to flow into said pots, when the liquid in said control pot drops below a predetermined level, and for automatically moving said valve means from fully open to fully closed position when the liquid in said control pot rises to said predetermined level, the unoccupied volume within said control pot intermediate its lower end and said predetermined level being no greater than that of any of the other pots, and the fluid flow from the main conduit into each pot being restricted, so that the control pot fills with liquid at least as quickly as said others.

4,183,177

AUTOMOBILE DOOR OPENING APPARATUS

George R. Kurdziel, 286 Red Oak, Williamsville, N.Y. 14221

Filed Feb. 23, 1978, Ser. No. 880,435
Int. Cl.[2] E05F *15/20*
U.S. Cl. 49—25 15 Claims



1. An automobile door opening apparatus for a wheeled vehicle having at least one door for permitting

ingress and egress to and from the interior of said vehicle, comprising;

(a) locking and latching means on said vehicle for normally locking and latching said door,

(b) means on said door located interiorily of said vehicle for normally actuating said locking and latching means,

(c) auxiliary means affixed to said vehicle for sequentially actuating said locking and latching means first from a locked position to an unlocked position and then from a latched position to an unlatched position,

(d) means for generating a control signal remote from and exteriorly of said vehicle,

(e) control means fixed to said vehicle for actuating said auxiliary means in response to said control signal,

(f) opening means fixed to only one of said door and body of said vehicle actuable to exert a force on said door sufficient to at least partially open the same in response to a signal from said auxiliary means to thereby permit rapid entry to the interior of said vehicle,

(g) said control means including a first switching device,

(h) said auxiliary means comprises a movable member located adjacent said locking and latching means for imparting a force thereto in response to the closure of said first switching device,

(i) a second switching device actuable by said movable member, and

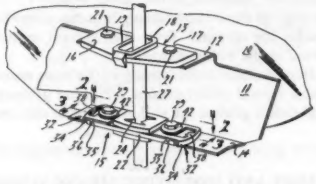
(j) said opening means comprises a second movable member located between said door and the vehicle for imparting a relative force therebetween sufficient to partially open the door in response to the closure of said second switching device.

4,183,178

WINDOW GLASS ADJUSTING DEVICE

Edward Kiefer, 16887 Fitzgerald, Livonia, Mich. 48154, and Robert B. Robertson, 18300 Parklane, Grosse Ile, both of Mich. 48138, assignors to Ford Motor Company, Dearborn, Mich.

Filed Dec. 1, 1978, Ser. No. 965,714
Int. Cl.[2] E05F *11/38*
U.S. Cl. 49—375 **5 Claims**



1. In a vehicle window assembly having a window panel movable in spaced relationship to and along a fixed guide rod during raising and lowering movements of the panel,

a guide bracket mounted on the window panel having upper and lower flange portions extending laterally toward the guide rod,

guide means mounted on the upper and lower flange portions, respectively, of the guide bracket,

one of the guide means having a slot therein extending laterally of the window panel and the other having an aperture therethrough in alignment with the slot in the one guide means,

the guide rod projecting through the slot and the aperture in the respective guide means and having sliding engagement with the side walls only of the slot and with the aperture wall,

the slotted and apertured guide means coacting with the guide rod to stabilize the window panel against tilting movement in the plane of the panel,

the apertured guide means further coacting with the guide rod to maintain the window panel in its spaced relationship to the guide rod,

the improvement comprising:

the apertured guide means being movable relative to the flange portion on which it is mounted and having ratchet engagement with resilient retainer means anchored to the same flange portion,

the ratchet engagement permitting lateral adjustment of the window panel relative to the guide rod,

the retainer means being operative to temporarily hold the apertured guide means and the window panel in adjusted spaced relationship,

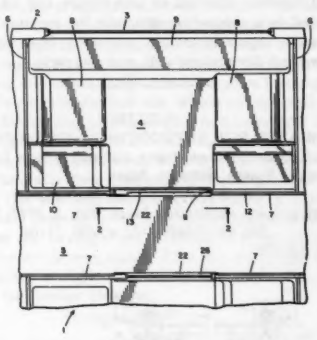
and fastening means for immovably securing the apertured guide means to the guide bracket flange portion on which it is mounted after adjustment.

4,183,179

SLIDING DOOR AND DOOR GUIDE ARRANGEMENT FOR A RAILWAY PASSENGER CAR COMPARTMENT

Jack E. Gutridge, Dyer; Roy W. Miller, Highland, and Walter J. Marulic, Gary, all of Ind., assignors to Pullman Incorporated, Chicago, Ill.

Filed May 3, 1978, Ser. No. 902,511
Int. Cl.[2] E05D *13/02*
U.S. Cl. 49—411 **10 Claims**



1. For a railway passenger car compartment having a floor including an aisle and a pair of longitudinally aligned spaced divider walls adjacent to said aisle and defining an access opening into said compartment, the improvement of a sliding door and door guide arrangment for said opening, comprising:

a door,

an elongated threshold plate on the floor and extending the width of the access opening beneath the door and having an upwardly opening longitudinally extending guide channel therein having dished-out end portions extending transversely therefrom at the respective ends of the channel, and

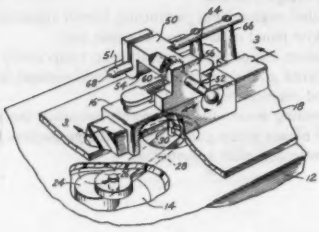
guide means depending from the door including biasing means and a vertical guide member, said vertical guide member being downwardly biased by said biasing means and slidably abutably engaged within the guide channel and being positionable generally adjacent a respective dished-out end portion in the open and closed positions of the door to accommodate discharge of foreign matter from the guide channel.

4,183,180

INSTRUMENT AND TOOL HONING MECHANISM

Victor E. Magnuson, 1818 Linden Ave., Mishawaka, Ind. 46544

Filed Mar. 2, 1978, Ser. No. 882,776
Int. Cl.[2] B24B *19/00*
U.S. Cl. 51—58 6 Claims



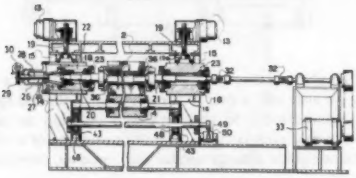
1. An instrument and tool honing mechanism for use with a machine having an elongated reciprocably moving bar, comprising a gear rack for mounting on and moving with said reciprocable bar, a spindle movable between an operable position and an inoperable position, a fixture for rotatably mounting said spindle in a position transverse to said bar in close proximity thereto, a honing element mounted on said spindle for rotation therewith, a gear mounted on said spindle for meshing with said gear rack to drive said spindle and said honing element in a reciprocating rotary motion and being movable between an operable position meshing with said rack and an inoperable position disengaged from said rack, and a pivoted member attached to said fixture and adapted to be connected to a supporting structure for moving said fixture and spindle angularly toward and away from said rack for engaging and disengaging said gear and rack.

4,183,181

APPARATUS FOR SUPPORTING A GRINDING ROLL

Noboru Kitazawa, Urawa, Japan, assignor to Soky Giken Kogyo Kabushiki Kaisha, Saitama, Japan

Filed Sep. 8, 1977, Ser. No. 831,516
Claims priority, application Japan, Jun. 3, 1977, 52-65498
Int. Cl.[2] B24B *7/12, 45/00, 53/04*
U.S. Cl. 51—75 8 Claims



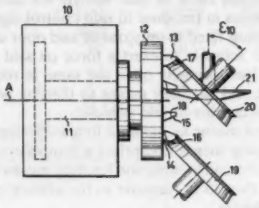
1. Apparatus for supporting a grinding roll of a strip metal grinding machine comprising a frame, a pair of axially aligned spaced spindles adapted to respectively engage opposite ends of the grinding roll placed therebetween, bearing means for journalling each of said spindles for rotation about its central axis, chock means for housing each of said bearing means within said frame, said chock means being movable within said frame perpendicular to the axis of rotation, one of said bearing means being slidable axially within its chock means so as to carry the spindle journalled therein axially toward and away from the other of said spindles to thereby enable engagement with and separation of said spindles from a roll placed therebetween.

4,183,182

METHOD FOR GRINDING CUTTING TOOLS AND GRINDING MACHINES FOR THE PERFORMANCE OF THE AFORESAID METHOD

Erich Kotthaus, Wallisellen, Switzerland, assignor to Werkzeugmaschinenfabrik Oerlikon-Buhrle AG, Zurich, Switzerland

Filed Feb. 2, 1978, Ser. No. 874,463
Claims priority, application Switzerland, Feb. 23, 1977, 2224/77
Int. Cl.[2] B24B *1/00*
U.S. Cl. 51—288 2 Claims



1. A method of grinding cutters which are detachably secured to a cutter head of gear cutting machines, the cutter head possessing sets of cutters of three respective cutter groups encompassing inner cutters, outer cutters and auxiliary cutters, each of said cutters having an outer flank, inner flank and cutting face, comprising the steps of:

(a) removing two cutter groups from the cutter head, wherein the group of cutters remaining at the cutter head define a first cutter group and the two removed cutter groups define second and third cutter groups;

(b) grinding the outer flanks, the inner flanks and the cutting faces of the cutters of the first cutter group;

(c) inserting the second cutter group into the cutter head while retaining the ground first cutter group mounted at the cutter head;

(d) grinding the second ground cutter group in the same manner as the first cutter group while the first cutter group is still mounted at the cutter head;

(e) inserting the third cutter group into the cutter head while retaining the ground first and second cutter groups mounted at the cutter head; and

(f) grinding the third cutter group in the same manner as the first and second cutter groups while the ground first and second cutter groups are still mounted at the cutter head.

4,183,183

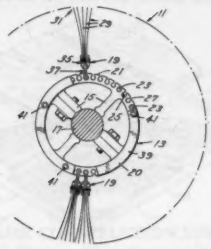
PACK UNIT AND MOUNTING MEANS THEREFOR

James A. Belanger, Northville, Mich., assignor to Belanger, Inc., Northville, Mich.

Filed Mar. 22, 1978, Ser. No. 888,895
The portion of the term of this patent subsequent to Apr. 29, 1992, has been disclaimed.
Int. Cl.[2] B24D *13/06*
U.S. Cl. 51—334 14 Claims

1. A pack unit comprising fill material adapted to be mounted in a position radially outwardly of the axis of a rotary driver structure, a clip member and a link member forming an assembly for supporting and so mounting said fill material on such structure, said assembly being continuously and uninterruptedly coextensive in axial length with said fill material, and in a solid cross-section throughout in a plane at 90° to said axis as thus mounted, said clip member presenting a radially outer portion of generally U-shape having a laterally extending base and having a pair of outer, generally parallel and spaced apart forked arms between which said fill material is clamped extending outwardly from the side edges of said base, said link member being made from a flexible plastic material and having radially inner and outer end portions which are separated by an

intermediate solid web portion, said link member having on the radially inner end portion an axially extending and transversely enlarged head mounting portion and having said radially outer end portion connected to the base of said clip member generally midway between the side edges thereof, said web portion being substantially narrower than said base so that said base



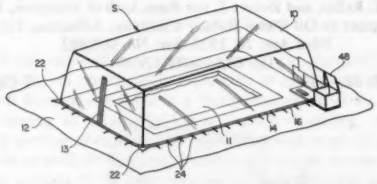
projects laterally in opposite directions beyond the sides of said web portion, said head portion and said web portion being shaped for a slidingly mating engagement with the driver structure, said flexible web portion being adapted to appreciably flex or bend when a force is applied to said clip member and fill material thus permitting said clip member and fill material to swing.

4,183,184

AIR-SUPPORTED SHELTER SYSTEM

Clarence Sargent, 153 McClellan Ave., San Mateo, Calif. 94403

Filed Aug. 18, 1978, Ser. No. 934,798
Int. Cl.[2] E04B *1/345*
U.S. Cl. 52—2 **9 Claims**



1. An air-supported shelter system comprising in combination:

(a) an inflatable enclosure attached to a base along the periphery of said enclosure and having a relatively narrow integral hem at the lower portion thereof, the peripheral edge of said enclosure being adapted to be in air-sealing contact with said base;

(b) a cable extending within said hem;

(c) a blower assembly for inflating said enclosure and maintaining said enclosure in inflated form; said shelter system being characterized by having:

(d) an anchoring means attaching releasably said enclosure to said base, said anchoring means including a plurality of corner anchors each of said corner anchors comprising a rod slidably insertable into an opening in said base, a plate affixed to said rod at a substantially right angle thereto and an outwardly extending curved flange, said flange having a recess forming a track for receiving said cable, and side anchors slidably insertable into openings in said base; and

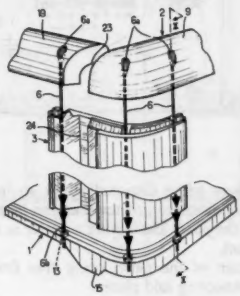
(e) a cable tautening means for holding the periphery of said enclosure firmly in contact with said base, whereby loss of air from under said enclosure is substantially prevented.

4,183,185

PREFABRICATED MODULAR BUILDING

Herve Farge, Maurepas, France, assignor to A.C.R.E.T.-Atelier du Centre de Recherche Etudes et Travaux, Levasville, France

Filed Mar. 6, 1978, Ser. No. 884,013
Claims priority, application France, Mar. 10, 1977, 77 07050
Int. Cl.[2] E04B *1/00*
U.S. Cl. 52—79.13 **8 Claims**



1. A prefabricated modular building, generally parallelepipedic in form, comprising a roof made of moulded plastic material, a floor and vertical panels, means for assembling these various elements together, four vertical corner elements placed respectively at the four corners of the building, extending over the whole height of the vertical panels, having vertical guttering channels in the outer surface thereof, and relatively positioning the roof and the floor, and vertical securing members anchored, at one of their ends, in one of the horizontal elements (roof or floor), passing through each corner element and tensioned and held, at their other ends, in the other horizontal element (floor or roof), the floor being formed in one piece with two lower longitudinal members forming skids constituting lower longitudinal ribs, which are upwardly open and suitable for housing pipes and with two transverse tunnels formed during moulding and allowing the building to be handled by means of a fork-lift truck, and the roof, moulded in one piece in rectangular form, comprising on its periphery two longitudinal ribs and two transverse ribs defining with each other, inwardly thereof, a recessed zone forming a collector for rain water and having channels arranged at the ends of the transverse ribs for the evacuation of the rain water and opening out and leading at right angles into said vertical guttering channels of said corner elements.

4,183,186

MULTILAYER STEEL-REINFORCED CONCRETE PANELS

Ernst Haeussler, Grashofstrasse 47, Essen-Bredeney, Fed. Rep. of Germany

Filed Aug. 23, 1978, Ser. No. 935,917
Claims priority, application Fed. Rep. of Germany, Aug. 24, 1977, 2738098
Int. Cl.[2] E04B *2/00, 5/00, 5/04;* E04C *2/04*
U.S. Cl. 52—410 **5 Claims**

1. A rectangular multilayer panel comprising:

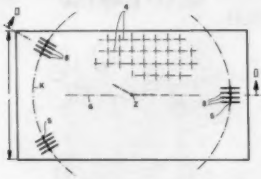
a rectangular steel-reinforced concrete outer plate;

a rectangular steel-reinforced concrete inner plate spaced from but juxtaposed and coextensive with the outer plate;

a layer of insulation coextensive with and between said plates; and

anchor means interconnecting said plates, said anchor means consisting of at least three flat anchors of rectangular configuration, each of said flat anchors being embedded in both of said plates and traversing said layer perpendicular to the planes thereof, two of said flat anchors taking up all

of the stresses between said plates and all of said anchors being disposed symmetrically with respect to an axis through the force and stress centrum of the panel parallel to the long sides thereof,



said anchors being disposed about an imaginary circle having a diameter greater than the length of the short side of the panel and having a center at said centrum of the panel,

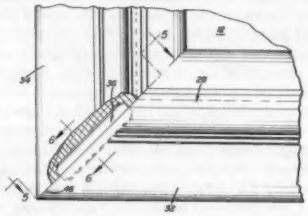
the centrum of the panel being free from any anchor interconnecting said plates.

4,183,187

CABINET DOOR CONSTRUCTION

Houston H. Simard, Louisville, Miss., assignor to U.S. Industries, Inc., New York, N.Y.

Filed May 11, 1978, Ser. No. 905,175
Int. Cl.[2] E04C *2/38*
U.S. Cl. 52—475 **6 Claims**



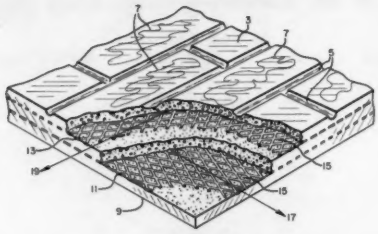
1. A cabinet door comprising a panel, a framework including a seat for floatingly receiving the panel, retainer means removably mounted on the framework for holding the panel in the seat of the framework, said framework defining a center opening, said panel being disposed in a position blocking the opening, with the framework and opening both having substantially rectangular configurations, and the panel also having a rectangular configuration and being slightly smaller in size than the opening, said framework having a front face and a rear face, the seat of the framework including a forwardly facing ledge extending into the opening rearward of the front face of the framework for permitting the panel to be inserted into the opening from adjacent the front face of the framework, said retainer means including a molding of substantially rectangular configuration and including a rectangular projection, the molding being removably attached to the front face of the framework, with the projection abutting the panel, said panel being permitted to float relative to the framework seat and the molding, said framework including two pairs of substantially parallel rails, each pair of rails being arranged substantially perpendicular to the other pair of rails, and connector means attaching adjacent rail ends together, the connector means comprising an elongated element including a pair of spaced substantially parallel legs and a web connecting together the legs, each of the legs extending equidistant in opposite directions from the web.

4,183,188

SIMULATED BRICK PANEL, COMPOSITION AND METHOD

Claude W. Goldsby, 7660 O'Neal Rd., Salem, Oreg. 97303

Filed Jul. 12, 1977, Ser. No. 814,914
Int. Cl.[2] E04B *5/04*
U.S. Cl. 52—596 **2 Claims**



1. A decorative fracture resistant building panel comprising:

a body having a front face and a rear surface;

a plurality of expanded metal reinforcement members in spaced-apart relation within the body, each member forming a separate and substantially continuous layer lying in a plane parallel to and between the front face and rear surface;

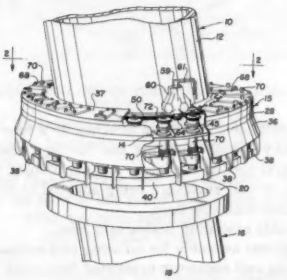
the body comprising a ductile cementaceous material including petroleum jelly a constituent thereof in the range of 0.016 to 0.18% and further including pumice as a constituent thereof in the range of 52 to 64%, so that by the presence of petroleum jelly and pumice in the recited ranges the body becomes ductile and resistant to cracking from nailing.

4,183,189

FLANGE CONNECTOR

Cecil T. Keller, and Robert J. von Bose, both of Arlington, Tex., assignors to Oil States Rubber Company, Arlington, Tex.

Filed Apr. 28, 1978, Ser. No. 900,882
Int. Cl.[2] E04H *12/00*
U.S. Cl. 52—637 **7 Claims**



1. A connector for securing a first member to a second member, each of said first and second members having a flange or other similar structure on the end thereof, the connector comprising: an actuation means having a driven shaft; a pinion drive gear on said driven shaft; means securing said actuation means to the first member; a ring gear; ring gear guide means on said first member; means movably securing said ring gear to said ring gear guide means such that the ring gear is in meshing relation with said pinion drive gear; a torque limiting means; a driven gear drivingly connected to said torque limiting means; means urging said driven gear into driving relation with said

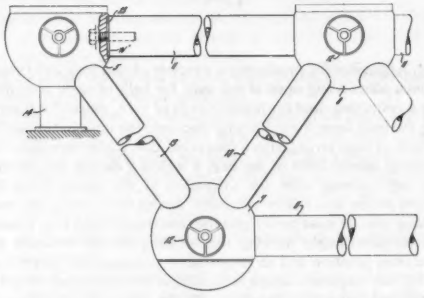
ring gear; a drive shaft; means rotatably securing said drive shaft to the flange on the first member; means drivingly connecting said torque limiting means to said drive shaft; clamp means; means movably securing said clamp means to the flange on the first member; and interengaging means on said drive shaft and on said clamping means to move said clamping means relative to the flanges on the first and second members.

4,183,190

SPACE FRAME CONSTRUCTION SYSTEM

Jean A. Bance, North Chicago, Ill., assignor to Roper Corporation, Kankakee, Ill.

Filed May 1, 1978, Ser. No. 901,575
Int. Cl.[2] E04C *3/02*
U.S. Cl. 52—648 **7 Claims**



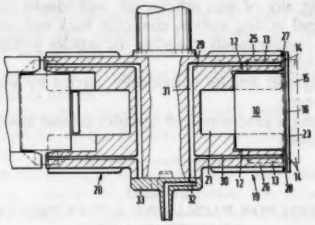
1. A tube-and-ball truss system for making a structural lattice comprising, in combination, a plurality of hollow metal balls spaced from one another in a three-dimensional array, each ball having an outwardly facing surface extending over a major portion of its area with spaced radial through-openings therein as well as an access opening on one side occupying a minor portion of the ball area, the outwardly facing surface including flat circular land surfaces surrounding the respective through-openings, metal tubes extending straight and rigid between adjacent ones of the balls, the ends of the tubes being in abutting relation to the land surfaces on the balls and in respective alignment with the through-openings therein; the tubes each being in the form of an extrusion having a smoothly continuous outer cylindrical wall and a central axially extending core together with longitudinally continuous angularly spaced webs for supporting the core with respect to the wall, the wall, core and webs being integral; the ends of the core having axially tapped holes; and clamping bolts for securing the tubes to the engaged balls; the bolts having heads inside of the balls and having respective shanks of a diameter which is a small fraction of the outer wall of the tube diameter, the shanks penetrating the through-openings and being in threaded engagement with the respective tapped holes so that upon turning the bolt heads by a tool extended into the access opening the tubes are clamped in tightly abutting relation to the balls, the cores of the tubes being hollow, having a continuous axial bore substantially corresponding in dimension to the diameter of the bolt shanks so that use of a tapping tool suffices to prepare the tubes for snug threaded engagement with the respective bolts.

4,183,191

VACUUM HOLDING APPARATUS FOR WRAPPING CIGARETTE PACKS IN BLANKS

Heinz Focke, Verden, Fed. Rep. of Germany, assignor to Focke & Co., Verden, Fed. Rep. of Germany

Filed Sep. 6, 1978, Ser. No. 939,938
Claims priority, application Fed. Rep. of Germany, Sep. 7, 1977, 2740266
Int. Cl.[2] B65B *11/28*
U.S. Cl. 53—225 **6 Claims**



1. An apparatus for wrapping a cigarette pack in a blank, comprising:

(a) a pocket having lateral boundry means whose end faces facing an entry side of the pocket embody vacuum suction means,

(b) means for pushing a cigarette pack against a blank disposed in front of the pocket and then into the pocket such that the blank is folded around the pack in a U-shaped manner with tubular casing flaps which extend rearwardly over the pack and which have laterally projecting end flaps,

(c) means for folding a first one of said projecting tubular casing flaps against a side of the pack,

(d) means for folding a second one of said projecting tubular casing flaps against said side of the pack in such a manner that it overlaps with the first folded flap, and

(e) means for sealing the first and second folded flaps together,

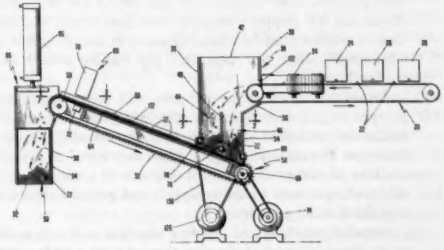
(f) said vacuum suction means engaging the laterally projecting end flaps of said first tubular casing flap to hold said first tubular casing flap in its folded position until the second tubular casing flap is folded thereover and sealed thereto.

4,183,192

METHOD AND APPARATUS FOR COUNTING STRAWS AND THE LIKE

Jesse B. Smaw, East Paterson, N.J., assignor to Marcal Paper Mills, Inc., East Paterson, N.J.

Filed Mar. 3, 1978, Ser. No. 883,317
Int. Cl.[2] B65B *57/20, 19/34*
U.S. Cl. 53—444 **11 Claims**



6. A method for counting elongated articles comprising the steps of:

arranging a supply of elongated articles within a hopper so that the articles are parallel with one another and transversely oriented with respect to an endless conveyor;

feeding said articles through one of two feed compartments provided at a lower end of said hopper to the endless conveyor;

urging said articles downward into individual engagement with transverse channels of said endless conveyor whereby said articles are arranged transversely on said conveyor belt;

brushing any of said articles not individually engaging a channel of said endless conveyor back into one of said feed compartments to agitate the articles within said one feed compartment;

counting said articles individually carried by said endless conveyor;

depositing a predetermined quantity of said articles into a container.

4,183,193

SYSTEM FOR PACKAGING A SUCCESSION OF OBJECTS IN A FOIL

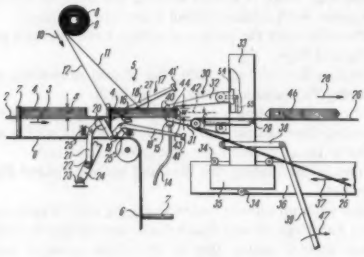
Hannsgeorg Klingelhöfer, and Fridrich Mann, both of Nürtingen, Fed. Rep. of Germany, assignors to Firma Bielomatik Leuze & Co., Neuffen, Fed. Rep. of Germany

Filed Feb. 13, 1978, Ser. No. 877,296

Claims priority, application Fed. Rep. of Germany, Feb. 17, 1977, 2706676

Int. Cl.² B65B *9/06*

U.S. Cl. 53—450 **9 Claims**



1. A packaging method comprising the steps of:

(a) advancing a succession of objects one-by-one to a sealing station having a fixed sealing location in a forward transport direction with the leading end of each object spaced by a predetermined gap behind the trailing end of the preceding object;

(b) supplying a web to said station in said direction and wrapping said web around said objects as they each are advanced to said station;

(c) gripping said web against opposite sides of each object with grippers after wrapping of said object and thereafter displacing the grippers with the wrapped object and said web through a predetermined distance in said direction to substantially align the respective gap trailing it with said sealing location;

(c') thereafter displacing the grippers with the wrapped and gripped object with said web gripped against it back in a backward transport direction opposite to said forward transport direction through a small step equal to a small fraction of said predetermined distance to create slack in said web upstream of the wrapped and gripped object at said fixed sealing location;

(d) thereafter pinching and welding together said web in the slack region thereof at the gap aligned with said location and severing the wrapped and gripped object at the weld from said web;

(e) advancing the severed-off and wrapped object from said station; and

(f) repeating steps (b) through (e) successively with each of the succeeding objects.

4,183,194

APPARATUS FOR PRODUCING A WRAPPER CLOSED BY A WELD SEAM FOR BALLS OF YARN

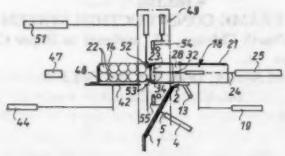
Florian Lucke, Mengen, Fed. Rep. of Germany, assignor to Lucke Apparate-Bau Gesellschaft Mit Beschrankter Haftung, Fed. Rep. of Germany

Filed Aug. 28, 1978, Ser. No. 937,689

Claims priority, application Fed. Rep. of Germany, Sep. 1, 1977, 2739329

Int. Cl.² B65B *43/36*

U.S. Cl. 53—571 **15 Claims**



1. Apparatus for producing a wrapper closed by a weld seam from a plastics bag open at one side, for balls of yarn, comprising a collecting duct for holding balls of yarn, means for inserting the balls from the collecting duct into the uppermost bag of a stack of bags arranged in a magazine, two folder members for forming lateral folds in the bag, a welding device for closing the bag opening after the formation of the lateral folds by means of the two folder members, means for moving the collecting duct at least partly into the stationarily held bag, means for reciprocatingly moving the welding device between an operative position and an inoperative position, and means for tilting the magazine which is located in the displacement path of the welding device together with the remainder of the stack located thereon out of said path in the operative position of the welding device.

4,183,195

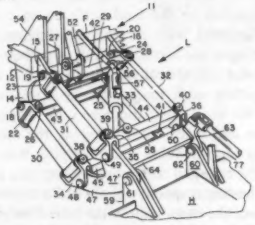
MOUNTING APPARATUS FOR OFFSET MOWER

Ronald N. James, Seguin, Tex., assignor to Terrain King Corporation, Seguin, Tex.

Filed Aug. 22, 1978, Ser. No. 935,797

Int. Cl.² A01D *75/18, 35/00*

U.S. Cl. 56—11.9 **17 Claims**



1. A mower mounting apparatus for mounting a mower at the side of a vehicle, comprising:

linkage means for connecting with the vehicle pivotally mounted about first pivot means for vertical pivoting movement of the linkage means to raise and lower the mower;

said linkage means being pivotally mounted about second pivot means for pivoting movement of the linkage means to allow non-rotational rearward translation of said

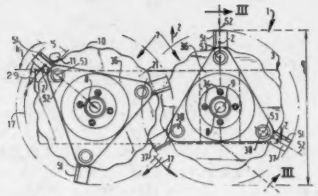
mower connected with the linkage means when the mower strikes an obstacle.

4,183,196

MOWING DEVICE

Pieter A. Oosterling, and Hendricus C. van Staveren, both of Nieuw-Vennep, Netherlands, assignors to Vicon N.V., Nieuw-Vennep, Netherlands

Filed Jan. 12, 1978, Ser. No. 868,884
Claims priority, application Netherlands, Jan. 19, 1977, 7700540; May 25, 1977, 7705784
Int. Cl.[2] A01D *55/18*
U.S. Cl. 56—295 **8 Claims**



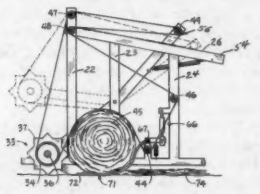
1. A mowing device comprising, in combination:
an elongate housing adapted to extend transversely of a line of mowing travel and having at least two drive shafts projecting upwardly therefrom;
gear means within said housing for rotating said drive shaft in relatively opposite direction;
a pair of carriers, one connected to each drive shaft, and at least one cutter associated with each carrier, each cutter having a cutting edge and means rotatably mounting each cutter to its associated carrier such that said cutting edge extends along a line which is angularly offset by greater than 90° from a line passing through the center of gravity of the cutter and the center of rotation of the associated carrier; and
a pair of non-driven counter-cutters carried by said housing, one beneath each carrier, each counter-cutter having a cutting edge underlying the cutting edge of the associated cutter and which includes at least portions which define an acute angle with the cutting edge of the associated cutter when the latter sweeps thereover.

4,183,197

MACHINE FOR FORMING LARGE ROUND BALES

Joseph B. Kucera, Traer, Iowa, assignor to Rudolph L. Lowell, Des Moines, Iowa, a part interest

Filed Sep. 18, 1978, Ser. No. 943,472
Int. Cl.[2] A01D *75/00*
U.S. Cl. 56—341 **8 Claims**



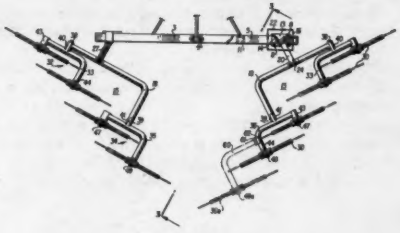
1. A machine for removing crop material from the ground and rolling it along the ground to form a cylindrical bale comprising:
(a) a mobile frame having a pair of upright transversely opposite frame structures,
(b) a rotatable material pickup means extended transversely between said opposite frame structures adjacent the rear end of the mobile frame,
(c) endless flexible means,
(d) means supporting said endless flexible means on said frame structures for movement in an upright path longitudinally of said mobile frame, said endless flexible means including a lower run portion extended upwardly and forwardly from said pickup means and movable in a forward direction to engage and roll the material gathered by the pickup means,
(e) a transverse cradle unit extended between said frame structures adjacent the front end of said lower run portion, said cradle unit including a plurality of transversely spaced arcuate tine members projected rearwardly and downwardly for termination adjacent the forward side of said pickup means,
(f) means pivotally supporting said cradle unit on said frame structures for up and down pivotal movement of said tine members, and
(g) means for pivotally moving the cradle unit from a lower position wherein the tine members are adjacent the ground surface and beneath a bale, to an upper position wherein a completed bale is supported on the tine members for transport on the mobile frame.

4,183,198

V-RAKE

Harm Sligter, Albany, Oreg., assignor to Lely Pacific, Albany, Oreg.

Filed Feb. 24, 1978, Ser. No. 881,140
Int. Cl.[2] A01D *77/00*
U.S. Cl. 56—377 **12 Claims**



1. A raking element comprising an elongated frame having multiple point coupling means connectable to a three point lifting hitch of a prime mover, two spaced apart rows of rake wheels being pivoted to said frame by corresponding pivots, said frame comprising elongated horizontal beam members extending substantially transverse to the direction of implement travel, said beam members being interconnected to one another and positioned one above the other, each row of rake wheels being connected to the frame with corresponding connection means that can be fixed in any one of a plurality of locations along the length of said beam members, said connection means including a lower pivot on one beam member and an upper resilient support connected to a further beam member, said rake wheels each being rotatable about a substantially horizontal respective axis that extends oblique to both the direction of travel and the longitudinal centerline of said frame.

4,183,199

APPARATUS FOR BRINGING TO REST THE ROTOR OF AN OPEN-END SPINNING DEVICE

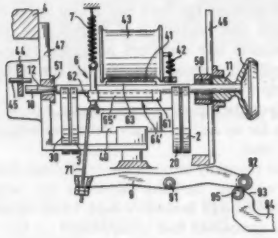
Fritz Schumann, Ingolstadt, Fed. Rep. of Germany, assignor to Schubert & Salzer, Ingolstadt, Fed. Rep. of Germany

Filed Feb. 16, 1978, Ser. No. 878,654

Claims priority, application Fed. Rep. of Germany, Feb. 19, 1977, 2707309

Int. Cl.[2] D01H 7/22, 1/12

U.S. Cl. 57—89 **2 Claims**



1. An apparatus for bringing to rest the rotor of an open end spinning apparatus, a rotor shaft attached to said rotor, freely rotatable support rollers positioned to form a wedge gap, said shaft being mounted in said wedge gap and being pressed against said support rollers, an axial stop, a tangential belt driving said shaft wherein an axial force arising from the support rollers presses said rotor shaft against said axial stop and, in bringing the spinning apparatus to rest, said shaft is moved away from the normal running position on the support rollers to an arrested position off of said support rollers, a pair of spaced stops having bores extending therethrough, said shaft extending through said bores of said spaced stops, a housing including a mounting plate enclosing said axial stop, and one of said spaced stops being carried in said mounting plate, the improvement comprising:

a conically tapering section provided on said shaft tapering inwardly away from said axial stop;

the bore extending through said one of said spaced stops being defined by a surface having a conicity corresponding to the conically tapering section provided on said shaft and being adjacent thereto;

said conically tapering section extending through said bore of said one of said spaced stops and terminating in said housing;

whereby when said shaft is moved from its normal running position to said arrested position, said conically tapering section on said shaft engages said conicity surface of said bore forcing said shaft against said spaced stop.

4,183,200

TENNIS RACKET STRING

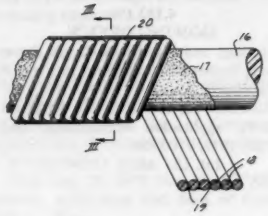
Girdhar Bajaj, Des Plaines, Ill., assignor to PepsiCo, Inc., Purchase, N.Y.

Filed Oct. 3, 1977, Ser. No. 838,669

Int. Cl.[2] D02G 3/44, 3/36

U.S. Cl. 57—234 **10 Claims**

1. A tennis racket string comprising a solid mono-filamentary core having strands wound thereabout and adhesively secured thereto without degradation of the strands, both said core and said strands being composed of a synthetic resin, said core having a thickness of three to six times the thickness of the strand, said string having a spring rate of from 45 to 65 pounds/inch (8.0 to 11.6 kg/cm) at a loading in the range of 50 to 100 pounds (22.7 to 45.4 kg), said string exhibiting a substantially linear stress-strain behavior in said range, a minimum tensile break load of 120 pounds (54.4 kg), a total thickness of from 0.040 to 0.055 inch (0.102 to 0.140 cm), a minimum overhand knot strength of 50 pounds (22.7 kg), and said strands being encased by a separate continuous, smooth outer resin layer composed solely of a set resin adhesive bonded to the string



thereby providing said string with an improved surface texture.

4,183,201

OPEN-END SPINNING MACHINE WITH MEANS FOR CATCHING AND REMOVING SEPARATED DEBRIS

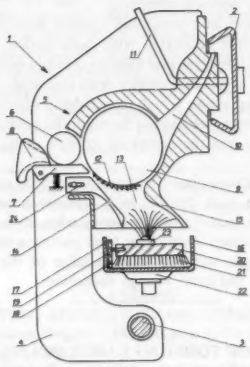
Fritz Stahlecker, Bad Überkingen, Fed. Rep. of Germany, assignor to Fritz Stahlecker and Hans Stahlecker, both of, Fed. Rep. of Germany

Filed Dec. 13, 1977, Ser. No. 860,093

Claims priority, application Fed. Rep. of Germany, Dec. 24, 1976, 2658752

Int. Cl.[2] D01H 11/00, 1/12

U.S. Cl. 57—301 **27 Claims**



1. Apparatus for removing debris from an open-end spinning machine of the type having a plurality of spinning assemblies arranged side by side with each of said spinning assemblies having shedding devices for shedding debris from fibrous material prior to introduction of the fibrous material to spinning rotor means to be spun; said apparatus comprising:

collecting openings at each of said spinning assemblies permitting egress of debris away from the shedding devices,

a stationary debris collecting channel extending along said spinning machine in open facing relationship to said collecting openings,

a plurality of channel openings disposed along the channel for accommodating removal of debris from the channel, said channel openings being spaced from one another by a distance greater than the width of a single spinning assembly,

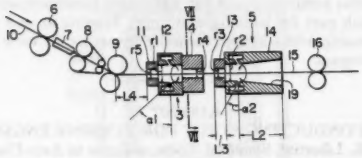
debris transport means movably disposed in said channel for transporting the debris from adjacent the respective collecting openings to the respective channel openings,

and suction applying means and suction connection means at said channel openings communicating said channel openings with the suction applying means.

4,183,202
METHOD AND APPARATUS FOR PRODUCING SPUN YARN

Toshihumi Morihashi, Kyoto, Japan, assignor to Murata Kikai Kabushiki Kaisha, Kyotoshi, Japan

Filed Oct. 7, 1976, Ser. No. 730,349
Claims priority, application Japan, Mar. 4, 1976, 51/23862
Int. Cl.[2] D01H 5/28, 7/92
U.S. Cl. 57—328 13 Claims



1. The method of producing a spun yarn comprising the steps of passing a staple fiber bundle through pneumatic twisting means, through an untwisting tube and through a false twisting means in line and in that order with the internal diameter of the untwisting tube being smaller than the internal diameter of the pneumatic twisting means and the false twisting means to effect ballooning of the fiber bundle between the front rollers and the untwisting tube and loosening and slipping of the fibers of the bundle in the pneumatic twisting means.

4,183,203
ELECTRONIC TIMEPIECE TIME ZONE DISPLAY

Shuji Maezawa, and Yasushi Okada, both of Suwa, Japan, assignors to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

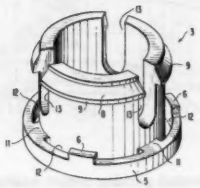
Filed May 25, 1977, Ser. No. 800,484
Claims priority, application Japan, May 28, 1976, 51-61945
Int. Cl.[2] G04B 19/22; G04C 17/00
U.S. Cl. 58—42.5 7 Claims

1. In a digital display for an electronic timepiece comprising in combination a plurality of numerical display digits for displaying time information and a plurality of visual indication display segments peripherally disposed about said numerical display digits for selectively indicating a predetermined time zone corresponding to the time displayed by said numerical display digits, the improvement comprising a bezel surrounding said plurality of visual indication display segments and having a plurality of first distinct indication means disposed therearound, each said first indication means being disposed proximate to the position of a visual indication display segment for identifying the predetermined time zone selectively indicated by the visual indication display segment, and a plurality of second indication means disposed on said bezel, each of said second indication means being positioned intermediate a specific visual indication display segment and a further first indication means representative of the time zone adjacent to the time zone represented by the specific visual indication display segment whereby the time zone indicated by the further first indication means corresponds to the time displayed by the numerical display digits when the time displayed is daylight savings time.

4,183,204
MEANS FOR SUPPORTING CLOCKWORK ELEMENTS OF CLOCKS

Roland Sauter, Eckener Strasse 34, D-7220 VS-Schwenningen, Fed. Rep. of Germany

Filed Jul. 19, 1977, Ser. No. 816,972
Claims priority, application Fed. Rep. of Germany, Aug. 5, 1976, 7624675
Int. Cl.[2] G04B 19/00
U.S. Cl. 58—126 R 7 Claims



1. Apparatus comprising a central support means for retaining clockwork mechanism elements such as a dial carrier and a mechanism housing,

said central support means comprising a generally cylindrical member having a diameter over its main body portion slightly less than that of the through apertures in said elements and having adjacent one end thereof an outwardly extending radial flange whose surface facing the opposite end of said member forms a supporting ledge for said elements when fitted with their respective through apertures surrounding said main body portion,

said cylindrical member having at its said opposite end a plurality of resiliently supported latch means for insertion into said through apertures of said elements during assembly of said elements into said member,

said member defining a plurality of axially extending recesses extending from said opposite end of said member to form at least in part said latch means,

said latch means each having at least a portion thereof normally extending beyond the diameter of the main body portion of said cylindrical member and each being resiliently movable toward the central axis of said member to permit the placement of each said element over said plurality of latch means and onto said member in abutment with said ledge, each said latch means being restored by its resilient support to its normal position once said elements have been assembled onto said member,

each said latch means having a surface thereon which faces said one end of said member to thereby prevent inadvertent removal of said elements from said member once assembled thereon,

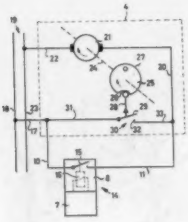
said radial flange being joined to said main body portion by a plurality of angularly spaced ribs each disposed generally opposite a corresponding one of said recesses,

said radial flange supporting thereon a plurality of upstanding protuberances whose spacing from said surfaces on said latch means is slightly less than the combined thicknesses of said elements supported on said central support means, each said protuberance being supported substantially midway between a pair of said ribs.

4,183,205
COIN OPERATED PARKING METER

Bernhard Kaiser, Villingen-Schwenningen, Fed. Rep. of Germany, assignor to Kienzle Apparate GmbH, Villingen, Fed. Rep. of Germany

Filed Oct. 4, 1978, Ser. No. 948,474
Claims priority, application Fed. Rep. of Germany, Oct. 8, 1977, 2745471
Int. Cl.[2] G07C *1/30*
U.S. Cl. 58—142 9 Claims

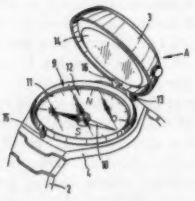


1. In a coin operated parking meter arrangement for automatically setting a parking time by inserting at least one coin, said meter having a clockwork and time indicating portion including an indicator and adapted to being reset upon a vehicle prematurely leaving a parking space, the improvement comprising:
- sensing means for sensing the parking space with respect to its occupied state and providing an electrical signal as an output thereof; and
- means responsive to said sensing means for resetting said meter to clear available parking time, said resetting means including:
  - an electric motor having a shaft,
  - a cam disk fastened to the shaft of said motor,
  - a coupling member arranged between said cam disk and said time indicating portion for returning the indicator of said indicating portion from an indicating position to a defined initial angle position, and
  - means responsive to said electrical signal for applying power to said motor for driving the coupling member to return the indicator to the defined initial angle position.

4,183,206
PORTABLE WATCH, ESPECIALLY WRISTWATCH

Ferdinand A. Porsche, Stuttgart, and Jan Matthias, Gries, both of Fed. Rep. of Germany, assignors to Ferdinand Alexander Porsche, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 833,992, Sep. 16, 1977, abandoned. This application Oct. 26, 1977, Ser. No. 845,654
Claims priority, application Fed. Rep. of Germany, Sep. 16, 1976, 2641651
Int. Cl.[2] G04B *47/06*
U.S. Cl. 58—152 C 7 Claims

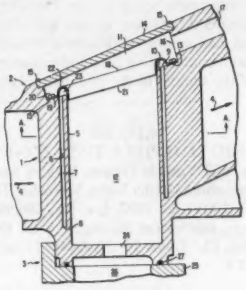


1. Portable watch and compass apparatus comprising:
- a first housing,
- a watch housed in said first housing,
- a second housing separate from said first housing, and a compass housed in said second housing,
- said housings being arranged one above the other with the upper of said housings being adjustably movable with respect to the other housing to accommodate viewing of the one of the watch and compass in said other housing,
- wherein a sighting device is provided for said compass, said sighting device including a gun sight and a notch at respective opposite sides of a viewing crystal covering the compass, and
- wherein portions of said gun sight serve simultaneously as a latch part for latching said upper housing at said lower housing with said upper housing obscuring the view of the compass.

4,183,207
OIL-CONDUCTING STRUT FOR TURBINE ENGINES

Zoltan L. Libertini, Stamford, Conn., assignor to Avco Corporation, Stratford, Conn.

Filed Mar. 7, 1978, Ser. No. 884,179
Int. Cl.[2] F02C *7/06*
U.S. Cl. 60—39.08 2 Claims



1. A lubricating fluid carrying, supporting strut for use within the gas flow path of a gas turbine engine comprising:
- an outer wall;
- a tubular wall forming an interior lubricating fluid passage within the strut and being spaced from said outer wall to form an insulating chamber about said interior passage, said chamber having a closed end and an open end; and
- a unitary seal member having an outer portion secured to the outer wall and being constructed with a convoluted intermediate portion positioned to bridge the open end of the insulating chamber and forming a sleeve portion extending from said intermediate portion to engage the inner wall in a sliding seal relation thereby closing the insulating chamber from the interior passage.

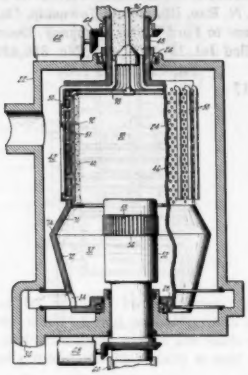
4,183,208
FLUIDIZED BED GASIFIER

John J. Horgan, Wethersfield, and Stuart Hamilton, Glastonbury, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Dec. 15, 1977, Ser. No. 861,036
Int. Cl.[2] F02B *43/08;* F02C *3/22*
U.S. Cl. 60—39.12 1 Claim

1. A gas turbine engine having a compressor, a turbine driving said compressor and a centrifugal coal-burning gasifier defining a first combustor generating hot gases for powering said turbine, means to rotate said gasifier means for generating a fluidized bed formed in a cylindrical wall in said gasifier, means for admitting coal into said gasifier through openings in said cylindrical wall and directing the coal from the outer diameter of said cylindrical wall toward its center, connection means supplying a portion of compressor discharge air to said

first combustor for fluidizing said fluidized bed and supporting combustion centrally within said cylinder to combust said coal, means for increasing the temperature of the hot gases admitted to said turbine, said means including a secondary combustor interposed between said centrifugal gasifier and said turbine for receiving the hot gases generated thereby, and means for



limiting the amount of compressor air to said fluidized bed so that the hot gases generated in said gasifier have a content of combustible gases and means for burning said combustible gases in said secondary combustor, and connection means interconnecting said compressor and said secondary combustor for supplying the remaining portion of compressor discharge air for supporting said combustion therein.

4,183,209

GAS TURBINE GUIDE APPARATUS

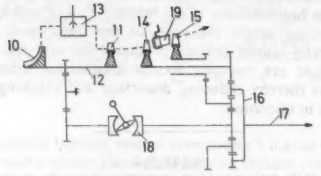
Sven-Olof Kronogård, Karstorpsvagen 31, Lomma, Sweden

Filed Sep. 20, 1977, Ser. No. 834,918

Claims priority, application Sweden, Sep. 24, 1976, 7610576

Int. Cl.[2] F02D *3/10*; F01B *9/02*

U.S. Cl. 60—39.16 R **7 Claims**



1. An automotive gas turbine plant including at least one power turbine rotor and a gasifier portion operable independently of the power turbine rotor, and further including a guide apparatus comprising a number of guide vanes and means to mount the same in a substantially radial position in a gas flow passage, downstream of said at least one power turbine rotor with reference to the direction of flow of the combustion gases from the gasifier, each vane having a basically airfoil section including a thick nose part adjacent to a leading edge of its profile and merging into a tapering tail part, terminated by a trailing edge, each vane being divided along a plane passing through said nose part to define a first portion, being stationary with respect to the guide apparatus and extending from said leading edge to said trailing edge, as well as a second portion extending through said thick nose part only and means to change the position of said second portion in relation to said first portion.

4,183,210

GAS TURBINE ENGINE POWERPLANTS

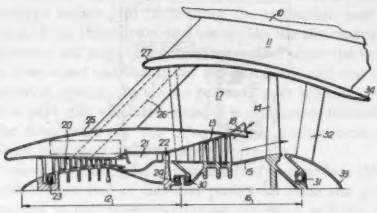
Leonard S. Snell, Bristol, England, assignor to Rolls-Royce Limited, London, United Kingdom

Filed Jan. 10, 1978, Ser. No. 868,385

Claims priority, application United Kingdom, Jan. 19, 1977, 2018/77

Int. Cl.[2] F02K *3/06*

U.S. Cl. 60—204 **2 Claims**



1. In a gas turbine engine powerplant comprising a gas generator, a fan turbine arranged downstream of the gas generator to be driven by an efflux of gas from the gas generator, a by-pass duct, a fan driven by the fan turbine and mounted for rotation in the by-pass duct and arranged to receive an efflux of gas from the gas generator, and in which the pressure of the efflux of the gas generator downstream of the fan turbine exceeds the pressure of the air flowing along the by-pass duct immediately ahead of the fan; the method of producing a more uniform outlet pressure of efflux across the exit face of the fan comprising the steps of mixing the higher pressure efflux of the gas generator with the lower pressure air from the by-pass duct and delivering the mixed flow to the inner radial portions of the fan, and maintaining a pressure differential across the entry face of the fan with highest pressure at the entry face of the fan radially innermost.

4,183,211

PROPULSION SYSTEM FOR SUPERSONIC AIRCRAFT

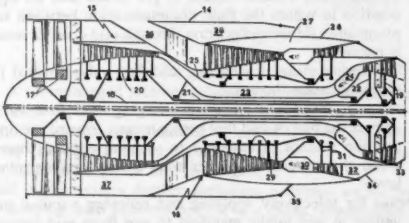
Claude C. F. Ménioux, Boulogne-Billancourt, France, assignor to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation, Paris, France

Filed Aug. 25, 1977, Ser. No. 827,704

Claims priority, application France, Aug. 30, 1976, 76 26938

Int. Cl.[2] F02K *3/04, 11/00*

U.S. Cl. 60—224 **6 Claims**



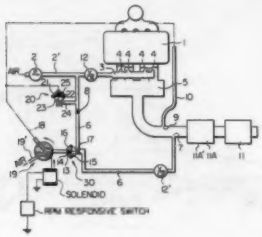
1. Propulsion system for supersonic aircraft, characterized by the fact that it comprises, arranged within a single engine nacelle and mounted concentrically so as to be able to operated independently, an outer turbojet engine and an inner turbojet engine, the outer turbojet engine extending around a narrow axial portion of the inner turbojet engine which narrow portion defines an air conduit from a high-pressure compressor to a combustion chamber.

4,183,212

SECONDARY AIR CONTROL IN VEHICLE EXHAUST PURIFICATION SYSTEM

Yasuo Takagi, Yokohama, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed Jun. 9, 1977, Ser. No. 805,229
Claims priority, application Japan, Jun. 15, 1976, 51/69262
Int. Cl.[2] F01N *3/10*
U.S. Cl. 60—274 **9 Claims**



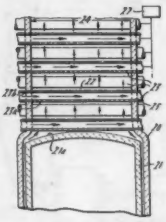
1. In an engine system:
an internal combustion engine;
an intake system connected to said engine and including an intake manifold;
an exhaust system connected to said engine, said exhaust system including a reactor and a muffler downstream of said reactor;
a secondary air pump driven by said engine to deliver secondary air at a flow rate proportional to the engine speed of said engine;
means for selectively supplying all of said secondary air to said reactor, none of said secondary air to said reactor and a predetermined portion of said secondary air simultaneously to said reactor and said muffler system ;
conduit means fluidly interconnecting said pump, a first portion of said exhaust system upstream of said reactor and a second portion of said exhaust system downstream of said reactor and upstream of said muffler for delivering secondary air from said pump to said first and second portions;
said conduit means having a vent opening communicating with the atmosphere;
a first valve disposed in said conduit means fluidly intermediate of said pump and said second portion of said exhaust system and downstream of said vent opening with respect to flow of secondary air through said conduit means, said first valve having a closed position in which fluid communication between said pump and said second portion through said conduit means is prevented and an open position in which the fluid communication between said pump and said second portion through said conduit means is permitted;
a first spring means for biasing said first valve toward the closed position thereof;
a vacuum responsive means for urging said first valve, against the bias of said first spring means, toward the open position thereof in response to vacuum applied thereto when the vacuum is higher than a first predetermined level;
means for selectively applying and relieving vacuum prevailing in said intake manifold to and from said vacuum responsive means;
a second valve cooperating with said vent opening, said second valve having a closed position in which said vent opening is closed and an open position in which said vent opening is opened;
a second spring means for biasing said second valve toward the open position thereof;
a second vacuum responsive means for urging said second valve, against the bias of said second spring means, toward the closed position thereof in response to vacuum prevailing in said intake manifold when the vacuum is higher than a second predetermined level that is lower than said first predetermined level.

4,183,213

HEAT EXCHANGER FOR STIRLING ENGINE

Vemulapalli D. N. Rao, Bloomfield Township, Oakland County, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Jul. 18, 1977, Ser. No. 816,635
Int. Cl.[2] F02G *1/04*
U.S. Cl. 60—517 **6 Claims**



1. A heat exchange assembly for transferring heat units between one body of hot gas, maintained at about one atmosphere and at a temperature of 2000°–3000° F., and another body of gas, maintained at 50–200 atmospheres and at a relatively cooler temperature than said one body of gas, the assembly comprising:
(a) walls defining a first enclosed volume,
(b) a plurality of tubes together defining a composite enclosed volume which is less than said first volume, said tubes extending through said enclosed volumes and walls, said tubes being integrated to said walls to maintain a pressure type separation between said first and composite volumes, and
(c) means for introducing said one body of gas to said composite volume and means for maintaining said another body of gas in said enclosed volume exterior of said tubes, whereby the tubes are maintained under a compressive force acting on the exterior surface of said tubes, the tube wall thickness being subjected to a thermal gradient having its highest value at the interior wall of said tubes and extending across the tube to the outer wall thereof, whereby tensile stresses produced by said temperature gradient are opposite to the mechanical compression forces thereby reducing distortion and cracking of said tubes in operation.

4,183,214

SPRING AND RESONANT SYSTEM FOR FREE-PISTON STIRLING ENGINES

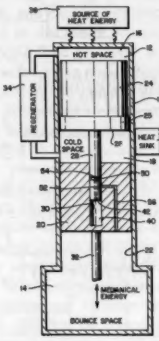
William T. Beale; James G. Wood, and David R. Gedeon, all of Athens, Ohio, assignors to Sunpower, Inc., Athens, Ohio

Filed May 5, 1977, Ser. No. 793,915
Int. Cl.[2] F02G *1/04*
U.S. Cl. 60—520 **9 Claims**

1. An improved, multiple ended, free-piston Stirling engine of the type having a housing defining symmetrically arranged work spaces each work space having a displacer cylinder formed therein said engine further including, a pair of symmetrically arranged, power piston cylinders each in communication at one end with a different one of said work spaces, wherein the improvement comprises:
(a) a plurality of displacers each reciprocally mounted in a different one of said displacer cylinders and each linked to said housing by a different bi-directional resilient means, wherein the mass of each displacer and the force constant of its associated resilient means are such that they are

mechanically resonant substantially at an operating frequency of said engine; and

(b) a plurality of power pistons sealingly slideable in said power piston cylinders, said power pistons being linked to



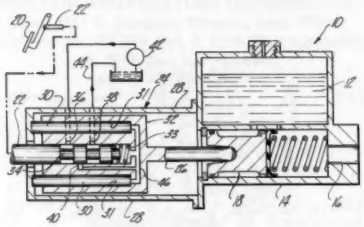
each other by a third, bi-directional, resilient means wherein the mass of said power pistons and the force constant of the resilient means are such that they are mechanically resonant substantially at said operating frequency.

4,183,215

PEDAL LINKAGE HYDRAULIC BRAKE BOOSTER

Arthur C. Weber, Utica, Mich., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jul. 22, 1977, Ser. No. 818,177
Int. Cl.² B60T *13/12*
U.S. Cl. 60—547 R **1 Claim**



1. In a vehicle braking system comprising a master cylinder equipped with a master piston for applying braking pressure on hydraulic brake fluid within the system, and a pedal operator operationally connected to said master piston for moving same in the pressure-increase direction when a manual force is applied to the pedal;

the improvement comprising hydraulic force booster means operatively interposed between the pedal and master piston for increasing the actuator force on said piston when the pedal operator is moved in the pressure-increase direction;

said force booster means comprising a first movable push rod (**22**) operationally connected to the pedal for movement along the rod axis; a movable housing (**32**) slidably disposed on the first push rod, said movable housing including a second push rod (**26**) axially aligned with the first rod and the master piston for applying a straight line operating force to said piston; a plurality of stationary force-booster pistons (**30**) grouped around the push rod axis in parallel non-coaxial relationship, each stationary piston extending into a bore (**31**) in the movable housing whereby hydraulic forces within the bores cause the housing to move axially for applying the desired operating force to the master piston;

said first push rod having two axially spaced grooves in its outer surface, the grooves being separated by a land and constituting a shuttle valve element for alternately pressurizing or depressurizing the movable housing bores; the movable housing having a first internal pressure port (**36**) connected to an external hydraulic pressure source, an internal drain port (**38**) connected to an external drain line, an internal liquid utilization port (**40**), and an internal passage means (**46**) connecting the utilization port with each of the aforementioned bores (**31**); the aforementioned grooves and ports being oriented so that when the housing is telescoped outwardly on the first push rod one of the grooves communicates the pressure port with the utilization port, and when the housing is telescoped inwardly on the first push rod the other groove communicates the drain port with the utilization port;

the movable housing having an internal stop surface (**33**) that contacts an end of the first push rod when the pedal is moved in the pressure-increase direction and the aforementioned bores (**31**) are depressurized;

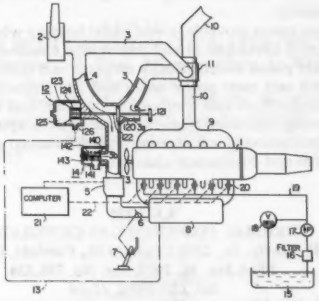
the movable housing having an internal passage (**47**) communicating the aforementioned passage means (**46**) with the end of the first push rod, whereby an axial hydraulic force is transmitted to the first rod.

4,183,216

SUPERCHARGED INTERNAL COMBUSTION ENGINE

Eizi Tanaka, Anjo; Michihiro Ohashi, Handa, and Akira Nishimatsu, Okazaki, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed May 19, 1978, Ser. No. 907,619
Claims priority, application Japan, May 23, 1977, 52-60315
Int. Cl.² F02B *37/08*
U.S. Cl. 60—611 **5 Claims**



1. A supercharged internal combustion engine comprising:

an intake system including an intake pipe;

a turbo supercharger mounted on said intake pipe and driven by the engine exhaust gases to produce a pressurized intake air to be fed into the engine;

said intake system further including a bypass intake pipe merging with said intake pipe at a point downstream of said supercharger;

first and second air release ports formed in said intake pipe downstream of said supercharger;

said merging point being located between said first and second air release ports;

a first valve means disposed in said intake system at said merging point for selectively pneumatically connecting said bypass intake pipe to said intake pipe downstream of said merging point to interrupt the communication be-

tween said intake pipe upstream of said merging point and said intake pipe downstream of said merging point, and pneumatically disconnecting said bypass intake pipe from said intake pipe downstream of said merging point to pneumatically connect said intake pipe upstream of said point to said intake pipe downstream of said point;

second and third valve means mounted on said intake pipe upstream and downstream of said merging point, respectively, for opening and closing said first and second air release ports, respectively;

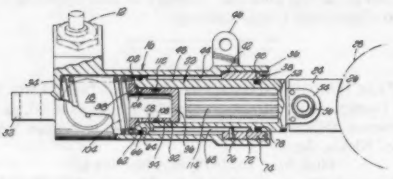
said first and second valve means being operative in response to changes of the engine operating conditions, and said third valve means being operative in response to the variation in the pressure of the supercharged intake air.

4,183,217

PRESSURE LIMITING PROPELLANT ACTUATING SYSTEM

Paul B. Reese, Los Angeles, and David W. Murphy, Garden Grove, both of Calif., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Aug. 4, 1978, Ser. No. 931,218
Int. Cl.[2] F01B *29/08*
U.S. Cl. 60—632 **5 Claims**



1. A pressure limiting propellant actuating system comprising;

an outer barrel housing having a combustion chamber therein;

a main piston movable in said barrel housing when gas pressure is developed in said combustion chamber;

a relief piston concentrically mounted and fixedly movable with said main piston when said gas pressure is exerted thereon from said combustion chamber, said relief piston having separation means for limiting the output force and, simultaneously, maintaining a predetermined gas pressure from said combustion chamber.

4,183,218

THERMAL POWERED GAS GENERATOR

David H. Eberly, Jr., 2303 Congress St., Fairfield, Conn. 06430

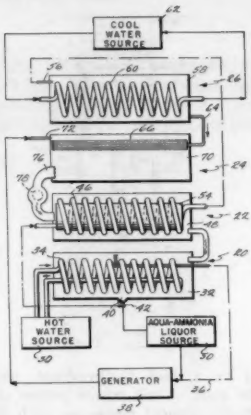
Filed Jan. 10, 1977, Ser. No. 758,334
Int. Cl.[2] F01K *25/06*
U.S. Cl. 60—673 **19 Claims**

1. A system for converting thermal energy into mechanical energy in a flow of pressurized gas comprising:

a gas pressurizing unit including a first tank for holding a quantity of a mother liquor, means for supplying heat to said liquor in said first tank to cause evaporation of said gas, mother liquor inlet means for receiving mother liquor, outlet means for removing the pressurized gas produced by said evaporation, the liquor outlet means for removing mother liquor forced from said first tank by the pressurized gas produced therein;

a gas absorbing unit including a second tank connected to said liquor outlet means of said first tank for receiving mother liquor from said first tank, an inlet means for receiving spent gas so that the spent gas is absorbed by the mother liquor and an outlet means for the mother liquor with absorbed gas, and

means for connecting said second tank outlet to said mother liquor inlet means including valve means for permitting mother liquor in said second tank to flow by gravity into said first tank when the pressure of gas in said first tank



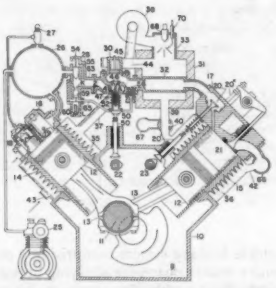
falls below a predetermined value and for preventing liquor from flowing into said first tank when the pressure in said first tank is above said predetermined value.

4,183,219

SELF STARTING HOT GAS ENGINE WITH MEANS FOR CHANGING THE EXPANSION RATIO

Eduardo A. Vargas, Av. Bogota 697, Mexico City 14, Mexico

Filed Feb. 25, 1977, Ser. No. 771,957
Int. Cl.[2] F02G *1/02*
U.S. Cl. 60—682 **10 Claims**



1. A self starting hot gas engine with means for changing the expansion ratio therein, comprising a bank of cylinders which includes at least one compression cylinder for compressing a working fluid, each of said compression cylinders having a cylinder head including means for controlling the suction and discharge of the working fluid, heaters for heating the working fluid, said compression cylinders supplying the compressed working fluid to be heated in said heaters; a second bank of cylinders comprising at least one expansion cylinder where the working fluid heated in said heaters is expanded, each of said expansion cylinders having a cylinder head including means for controlling the intake and exhaust of the heated working fluid, said expansion cylinders producing the total engine power; a piston in each of said compression and expansion cylinders, a connecting rod carried by each of said pistons, a cylinder block in which is mounted a crankshaft, each of said connecting rods being connected to said crankshaft, said cylin-

der block including actuator means for filling said heaters with working fluid and for opening and closing the intake and exhaust valves in said expansion cylinders at predetermined times, said means for controlling the discharge of said compressed working fluid, and each one of said compression cylinders being connected to discharge compressed working fluid to a compressed working fluid reservoir, a starting and throttle valve assembly connected to an outlet duct of said compressed working fluid reservoir, a feed valve assembly for each of said expansion cylinders connected to said assembly of start and throttle valves, said feed valve assembly comprising a check valve which is actuated by said actuator means for filling said heaters and by the pressure of the working fluid flowing through said feed valve assembly, said check valve comprising means to prevent back flow of working fluid from said heaters toward said compressed working fluid reservoir, a working fluid accumulator connected to the outlet duct of each of said feed valve assembly comprising means for changing the gas volume which can be stored in said accumulators and said heaters and which is the gas volume to be expanded in its respective expansion cylinder; each feed valve assembly being connected to its respective heater, said heaters being located within a combustion chamber which includes means for supplying and ignition of the fuel, each one of said heaters being connected to each one of said expansion cylinders and forming a gas flow circuit between said compression and said expansion cylinders, an auxiliary compressor connected to said gas flow circuit before said start and throttle valve assembly, said auxiliary compressor acts to maintain fully charged with pressurized working fluid said compressed working fluid reservoir, means connected to said gas flow circuit for governing the delivery of compressed working fluid to said compressed working fluid reservoir and for placing in idle said compression cylinders.

4,183,220

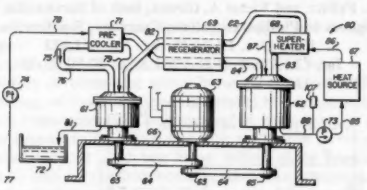
POSITIVE DISPLACEMENT GAS EXPANSION ENGINE WITH LOW TEMPERATURE DIFFERENTIAL

John B. Shaw, 1812 E. Marlette, Phoenix, Ariz. 85016

Division of Ser. No. 731,009, Oct. 8, 1976. This application Jul. 20, 1978, Ser. No. 926,452

Int. Cl.[2] F01K *25/00*

U.S. Cl. 60—682 **7 Claims**



1. A closed cycle energy conversion system comprising:
a dual fluid compressor,
a dual fluid expander,
said compressor and said expander being coupled to a shaft energy converter,
a heat transfer regenerator,
a heat acquisition apparatus,
a heat rejection apparatus,
a working gas,
said gas circulating sequentially through said compressor, said regenerator, said heat acquisition apparatus, said expander, said regenerator and said heat rejection apparatus, all in a closed loop, by means of induced pressure differentials,
a heat circulating liquid,
a first pump for circulating a portion of said liquid through said compressor and said heat rejection apparatus,
a second pump for circulating a portion of said liquid through said heat acquisition apparatus and said expander,
said expander utilizing thermodynamically available heat energy to drive said compressor and said shaft energy converter.

4,183,221

CRYOGENIC LIQUEFIED GAS TANK

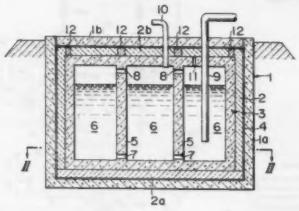
Katsuro Yamamoto, deceased, late of Tokyo, Japan (by Michiko Yamamoto, legal representative), assignor to Bridgestone Liquefied Gas Co. Ltd., Tokyo, Japan

Filed Jun. 27, 1977, Ser. No. 810,677

Claims priority, application Japan, Jul. 2, 1976, 51/79334

Int. Cl.[2] F17C *3/02*

U.S. Cl. 62—45 **12 Claims**



1. A cryogenic liquefied gas tank comprising a gas-tight outer vessel, a heat insulating layer provided at the inside of said outer vessel, and a plurality of liquid-tight inner vessels each being made of concrete and provided at the inside of said heat insulating layer, said inner vessels each receiving a load of cryogenic liquefied gases and supporting the hydraulic pressure of said load while said outer vessel supports the gas pressure of said load.

4,183,222

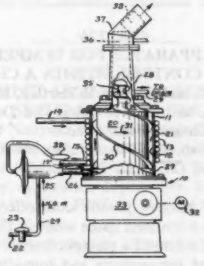
ICE MAKER WITH THERMOSTATIC WATER CONTROL

Donald F. Swanson, St. Paul, Minn., assignor to Whirlpool Corporation, Benton Harbor, Mich.

Division of Ser. No. 698,471, Jun. 21, 1976, Pat. No. 4,040,267. This application Aug. 1, 1977, Ser. No. 820,645

Int. Cl.[2] F25C *1/14*

U.S. Cl. 62—71 **11 Claims**



1. A method of continuously producing ice on a freezing surface comprising:
refrigerating said freezing surface to a subfreezing temperature with a refrigerating means including an evaporator in heat exchange relationship with said freezing surface and causing liquid refrigerant to vaporize therein to form gaseous refrigerant, said evaporator having a connection to a gaseous refrigerant suction line for delivering the gaseous refrigerant thereto;

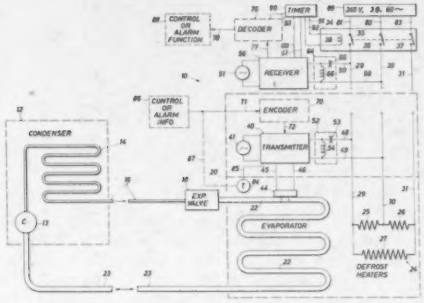
supplying a flow of water to said freezing surface in excess of the amount required for forming ice;
sensing a temperature condition of the gaseous refrigerant;
varying the volumetric flow of water to said freezing surface in accordance with the sensed temperature condition to be proportionate to the capacity of said refrigerating means to form ice on said freezing surface; and
continuously harvesting ice from said freezing surface.

4,183,223

METHOD AND APPARATUS FOR SIGNAL TRANSMISSION IN REFRIGERATION UNITS

Richard H. Alsenz, 9720 Town Park, Suite 101, Houston, Tex. 77036

Filed Jan. 30, 1978, Ser. No. 873,611
Int. Cl.[2] F25D *21/02*
U.S. Cl. 62—80 **34 Claims**



1. A method of signal transmission in a conventional refrigeration system using the defrost heater conductors as a transmission medium for refrigerator control and alarm signals, comprising the steps of
generating high frequency electrical signals functionally related to selected refrigeration system control information,
transmitting said high frequency signals over the defrost heater conductors,
receiving said transmitted control signals from the defrost heater conductors and causing said control signals to control the selected function of the refrigeration system.

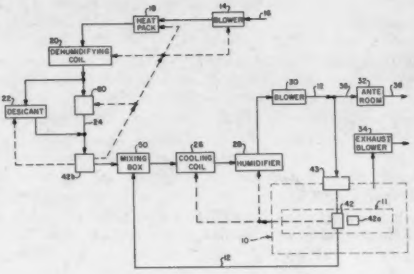
4,183,224

METHOD AND APPARATUS FOR TEMPERATURE AND HUMIDITY CONTROL WITHIN A CHAMBER

Adrian O. Rule, III, and William E. Bartley, III, both of Chagrin Falls, Ohio, assignors to Integrated Development and Manufacturing, Chagrin Falls, Ohio

Filed Feb. 22, 1978, Ser. No. 880,196
Int. Cl.[2] F25D *17/06, 23/00*
U.S. Cl. 62—91 **8 Claims**

1. A method to achieve precise controlled humidity and temperature within a confined space wherein the process operates to the right of a line of a physchrometric chart between the point of desired temperature and humidity entering the confined space and the temperature and humidity in the air leaving the space, comprises the steps of:
(a) effecting circulation of a predetermined volume of air through the control space to achieve a substantially uniformed distribution of the air throughout the space;
(b) thoroughly mixing into the main stream a small portion of makeup air at a controlled humidity and temperature level to return the main stream to about the desired temperature and humidification levels;
(c) additionally selectively cooling the main stream of air with makeup air mixed without stripping any moisture therefrom;
(d) selectively adding moisture to the mixed air flow stream to bring the humidification level up;



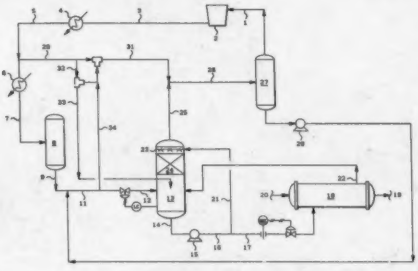
(e) providing moving force to the air stream immediately subsequent to moisture addition to uniformly distribute the moisture throughout the air stream; and
(f) effecting control of the makeup air input, the selective cooling and selective moisture addition by control means within the confined space.

4,183,225

PROCESS AND APPARATUS TO SUBSTANTIALLY MAINTAIN THE COMPOSITION OF A MIXED REFRIGERANT IN A REFRIGERATION SYSTEM

Leo L. Politte, and Victor A. Giroux, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

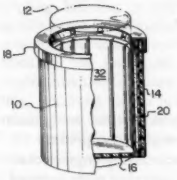
Filed Dec. 19, 1977, Ser. No. 861,923
Int. Cl.[2] F25B *1/00;* **F25J** *3/02;* **F25B** *43/00*
U.S. Cl. 62—114 **8 Claims**



1. In a process of cooling employing a mixed refrigerant, the process which comprises:
(a) compressing a hot mixed refrigerant gas, comprising at least one lower boiling and at least one higher boiling component, to a hot compressed gas stream,
(b) cooling said hot compressed gas stream, thereby producing a cooled liquid refrigerant,

(c) flashing said cooled liquid refrigerant to produce a first vaporous stream richer in lighter components, and a first liquid refrigerant richer in heavier components,
(d) contacting at least a portion of a liquid refrigerant cycle stream hereinafter recited with a heat source, thereby cooling in part said heat source, and warming and partially vaporizing said liquid refrigerant cycle stream to produce a two phase vapor/liquid refrigerant,
(e) separating said two phase vapor/liquid refrigerant, producing a second vaporous stream and a second liquid refrigerant,
(f) combining said second liquid refrigerant and said first liquid refrigerant as said liquid refrigerant cycle stream,
(g) combining said first and second vaporous streams as a combined vapor stream,
(h) contacting said combined vapor stream with a further portion of said liquid refrigerant cycle stream, thereby at least partially saturating said combined vapor stream with said heavier components to produce said hot mixed refrigerant gas.

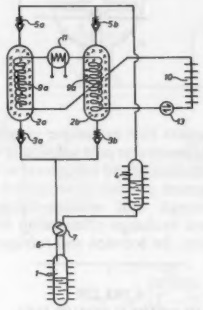
4,183,226
REFRIGERATED BEVERAGE HOLDER
Stanley R. Moore, Dallas, Tex., assignor to Freeze Sleeves of America, Inc., Dallas, Tex.
Filed Jul. 18, 1977, Ser. No. 816,434
Int. Cl.[2] F25D *3/08*
U.S. Cl. 62—457 **4 Claims**



1. A structure for holding a beverage container and chilling the contents during consumption, comprising:
a cylindrical cup closed at one end and open at the other for receiving a beverage container, said cup being slightly greater in diameter than a beverage container to be received;
a broad, relatively thin walled bag having a seal around its edges;
a freezable fluid filling said sealed thin walled bag;
a plurality of transverse seams between opposing walls of said bag, said seams extending parallel to one another and each transverse seam intersecting an edge seam at each and thereof to form said bag into a plurality of elongate sealed sections, said bag being folded along transverse seams into a cylindrical configuration and received into said cylindrical cup to conform to the outside walls of a beverage container placed into the cup for chilling of the beverage when said fluid is frozen.

4,183,227
HEAT PUMP
Jacques Bouvin, St. Martin-du-Vivier, and Christian C. Jahan, Bois-Guillaume, both of France, assignors to Exxon Research & Engineering Co., Florham Park, N.J.
Filed Jan. 9, 1978, Ser. No. 868,047
Claims priority, application United Kingdom, Jan. 17, 1977, 1691/77
Int. Cl.[2] F25B *17/08, 15/10*
U.S. Cl. 62—480 **7 Claims**

1. A heat pump comprising:
two intermittently operated adsorbers;
two condensers and an evaporator common to said adsorbers, said adsorbers, condensers and evaporator being operatively connected so that in a first mode of operation vaporizable liquid from said evaporator can be passed from said evaporator to the first of said adsorbers and be adsorbed therein while vaporizable liquid adsorbed in said second of said adsorbers can be desorbed, sent to the second of said condensers and returned from said condenser through a conduit to said evaporator, and during a second mode of operation said liquid in said evaporator can be sent to said second adsorber for adsorption therein and wherein said liquid adsorbed in said first adsorber can be desorbed and sent to the first of said condensers where it is condensed and returned to said evaporator;
a heat circuit including a heat transfer medium and means for heating said heat transfer medium, said heat circuit being in heat exchange relationship with said adsorbers and said



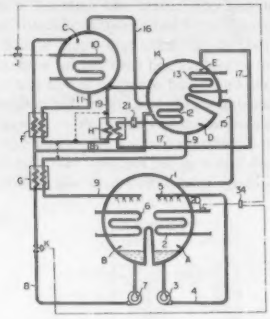
condensers; means for circulating said heat transfer medium in said first mode of operation so that said heat transfer medium is passed in heat exchange relationship with said first adsorber and said second condenser, thereby cooling the vaporizable liquid therein, and thereafter said heat transfer medium is heated by said heating means and then passed in heat exchange relationship with said first condenser and said second adsorber, thereby heating the vaporizable liquid therein, and in said second mode of operation, the flow of said heat transfer medium is reversed whereby said heat transfer medium is first passed in heat exchange relationship with said second adsorber and said first condenser and thereafter is heated by said heating means and passed in heat exchange relationship with said second condenser and said first adsorber.

4,183,228
DOUBLE EFFECT ABSORPTION REFRIGERATING SYSTEM COMPRISING
Shozo Saito, and Naoyuki Inoue, both c/o Ebara Corporation, 11-1, Haneda Asahi-cho, Ota-ku, Tokyo, Japan
Filed Mar. 14, 1978, Ser. No. 886,571
Claims priority, application Japan, Mar. 22, 1977, 52-31303
Int. Cl.[2] F25B *33/00, 15/00*
U.S. Cl. 62—497 **8 Claims**

1. A double effect absorption refrigerating system comprising:
an evaporator having therein a line for passing medium to be chilled;
an absorber associated with said evaporator;
a first generator associated with a heat source;
a second generator;
a condenser associated with said second generator;
means for circulating solution from the absorber to the first generator and thence to the second generator and back to the absorber and including a solution conduit having a

first portion between said first generator and said second generator;

means for directing refrigerant from the first generator to the evaporator through the second generator and the condenser and including a refrigerant conduit having a first portion downstream of said second generator; and



a solution-refrigerant heat exchanger to which said conduit portions are connected to pass solution in said first portion of said solution conduit and refrigerant in said first portion of said refrigerant conduit downstream of said second generator through said solution-refrigerant heat exchanger in heat exchange relationship for effecting heat transfer between the solution and refrigerant.

4,183,229

FLEXIBLE COUPLING

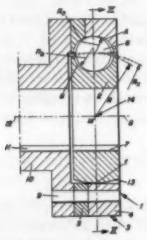
Carl E. Johansson, Le Lavandou, France, assignor to SKF Industrial Trading and Development Company B.V., Nieuwegein, Netherlands

Filed Jul. 11, 1977, Ser. No. 814,399

Claims priority, application Netherlands, Jul. 9, 1976, 7607603

Int. Cl.[2] F16D *3/64*

U.S. Cl. 64—14 **7 Claims**



1. In a flexible coupling including first and second members, the first member having an outer generally circular first surface about a first axis the second member having an inner generally circular second surface about a second axis and adjacent and radially outward of said first surface, each of said surfaces including a plurality of spaced-apart generally hemispherical cavities, each of said cavities of one surface being adjacent and facing one corresponding cavity in the other surface, each pair of opposing cavities thus defining a pocket, a plurality of resilient elements, each situated in one of said pockets, the improvement in combination therewith wherein, as seen in a sectional view of said coupling cut by a longitudinal plane through said first and second axes, said first surface defines a convex curve, said second surface defines a generally straight line, and said first surface contacts said second surface along a generally circular interrupted line extending circumferentially about said axes, said coupling permitting angular misalignment between the axes of said first and second members.

4,183,230

CENTRIFUGAL GOVERNOR FOR ENGINE IGNITION SYSTEM

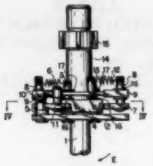
Yoshikazu Yagi, Anjo, Japan, assignor to Nippondenso Co., Ltd., Kariya, Japan

Filed Jul. 19, 1978, Ser. No. 926,116

Claims priority, application Japan, Aug. 10, 1977, 52-106944[U]

Int. Cl.[2] H01H *19/62*; F02D *5/04*; F16D *5/00*

U.S. Cl. 64—25 **3 Claims**



1. A centrifugal governor for an ignition distributor of an internal combustion engine comprising:

a drive shaft for transmitting engine rotation, said drive shaft having a weight carrying plate secured to said drive shaft to rotate therewith and a couple of first weight support pins secured thereto,

a first advance cam rotatably carried by said drive shaft and disposed on said weight carrying plate, said cam having a couple of second weight support pins secured thereto,

a couple of first weights pivotally supported by said first weight support pins and disposed to engage with said first advance cam so that as speed increases above a first predetermined speed said first weight causes said first advance cam to move relative to said drive shaft,

a second advance cam rotatably carried by said drive shaft and disposed on said first advance cam, last said cam having a couple of spring support pins, a couple of arcuate openings through which said first support pins extend and spark signal generating means secured thereto, said first and second cam support pins and said spring support pins extend from said second advance cam,

a couple of second weights pivotally supported by said second support pins and disposed to engage with said second advance cam so that as speed increases above a second predetermined speed, said second weight causes said second advance cam to move relative to said drive shaft,

a couple of first spring disposed on said second advance cam for resiliently connecting said first cam support pin and said second cam support pin to provide spring force against the movement caused by said first weight,

a couple of second springs disposed on said second advance cam for resiliently connecting said second cam support pin and said spring support pin to provide spring force against the movement caused by said second weight,

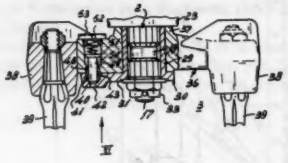
whereby said second weight support pins carry said first and second springs.

4,183,231

ROTARY HARROWS

Cornelis van der Lely, 7 Brüschenrain, Zug, Switzerland

Continuation-in-part of Ser. No. 592,917, Jul. 3, 1975, abandoned. This application Aug. 9, 1977, Ser. No. 823,147
Claims priority, application Netherlands, Jul. 5, 1974, 7409104
Int. Cl.² F16D *3/56, 9/00*
U.S. Cl. 64—28 R **11 Claims**



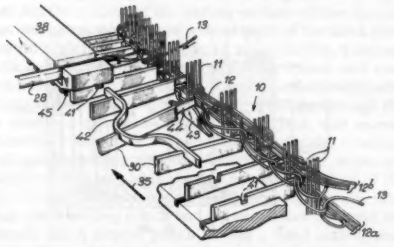
1. A shearing coupling for transmitting force between a first coupling member and a second coupling member, comprising an elongated shear pin interconnecting said first coupling member to said second coupling member in a first operative position that holds the two coupling members against relative movement, said shear pin being shearable once the force exceeds a predetermined amount, whereby at least one of the coupling members is then set in relative movement to the other, said first coupling member comprising displacement means that automatically urges the remainder of said shear pin longitudinally relative to said first coupling member into a second operative position, the remainder of said shear pin holding said two coupling members against relative movement in said second position, retaining means holding said shear pin against further displacement relative to said first coupling member in each of the operative positions.

4,183,232

METHOD AND MACHINE FOR THREE-DIMENSIONAL WEAVING FOR OBTAINING WOVEN HOLLOW REINFORCEMENTS OF REVOLUTION

Jean Banos, Merignac; Jean-Claude Cantagrel, Saint Aubin de Medoc; Georges Cahuzac, and Jean-Louis Darrieux, both of Merignac, all of France, assignors to Societe Nationale Industrielle Aero-Spatiale, Paris, France

Filed Jun. 19, 1978, Ser. No. 916,554
Claims priority, application France, Jun. 20, 1977, 77 18831
Int. Cl.² D04B *9/12*; D03D *37/00, 35/00*
U.S. Cl. 66—11 **15 Claims**



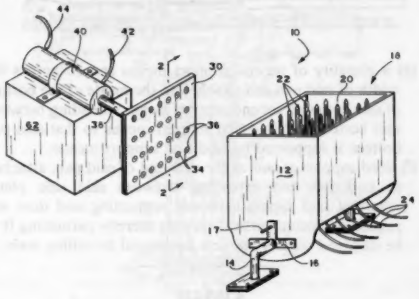
1. A method of producing a three-dimensional hollow woven reinforcement article comprising the steps of rotating a plurality of rod-bunches circumferentially arranged about a central axis, each rod bunch having a plurality of elongated rods spaced along a common radius and respectively lying in circumferentially spaced relation to the corresponding rod in the adjacent rod bunch, feeding a substantially continuous yarn between each of the adjacent radially-spaced rods to form superimposed courses of helically wound yarn; simultaneously feeding a further yarn radially between adjacent circumferentially spaced rod bunches intermediate each of said courses and forming chain stitches in said further yarn enclosing the radially-spaced rods of each rod bunch between each of said courses of helically wound yarn; and pressing said helically wound yarn and chain-stitched yarn along said rods to obtain a generally woven article of uniform density.

4,183,233

APPARATUS FOR FLUID TREATMENT OF TEXTILES

Jerald E. Brown, Jasper, Ga., assignor to Simon Klebanow, Greenwich, Conn.

Continuation-in-part of Ser. No. 792,721, May 2, 1977, abandoned. This application Apr. 11, 1978, Ser. No. 895,507
Int. Cl.² D06B *5/20*
U.S. Cl. 68—5 C **9 Claims**



1. Apparatus for the treatment of skeins of yarns with a fluid, which comprises;

an enclosure having a wall defining an interior treatment chamber for receiving the skeins and having an opening therein providing access to the chamber;

a removable closure for the opening;

means associated with the enclosure for compressing skeins received in the treatment chamber, within a compression zone of the chamber;

conduit means having a first open end outside of the enclosure and a second open end at a point within the compression zone and spaced from the enclosure wall;

means for metering and delivery of treating fluid through the second open end of the conduit means, to a site within the body of the compressed skeins in a proportion which will be fully absorbed in a predetermined area of the skeins compressed in the chamber; and

means for delivery of wet steam to the site, following deposition of treating fluid thereat.

4,183,234

HORIZONTAL APPLICATOR

Heinz Grüber, Tönisvorst, Fed. Rep. of Germany, and Alfred Keller, Inman, S.C., assignors to Klüsters Corporation, Spartanburg, S.C.

Filed Feb. 24, 1978, Ser. No. 881,119
Int. Cl.² D06B *1/06*
U.S. Cl. 68—205 R **14 Claims**

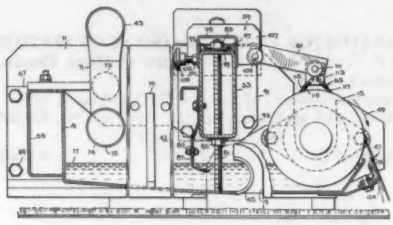
1. In apparatus for applying application liquid to a web of material moving therebelow, the apparatus including a pan, an application roll supported for rotation in said pan and a doctor blade which can be brought into contact with the edge of said roll to scrape liquid therefrom, the doctor blade being directed so that the liquid will flow in a film onto the web of material therebelow, the improvement comprising:

(a) first and second side plates spaced apart;

(b) bearing means in each of said side plates, the roll extending between said side plates and supported in said bearing means;

(c) first support means extending between said side plates directly behind said roll;

(d) the pan being disposed between said side plates and having a portion extending below said roller, the major portion of said pan extending behind said roller;



(e) a plurality of second support means spaced across the width of said pan and attached to the inside of the bottom of said pan, said second support means extending between said bottom and said first support means so that said pan bottom is supported by said first support means;

(f) third support means at the rear end of said pan, attached to said pan and extending between said side plates whereby said apparatus is self supporting and does not require extensive vertical support thereby permitting it to be disposed closely above a horizontal travelling web.

4,183,235

PROTECTED PADLOCK

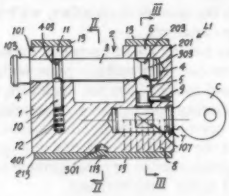
Giorgio V. Coralli, and Alessandro Brunelli, both of Bologna, Italy, assignors to Viro Innocenti S.p.A., Zola Predosa, Italy

Filed Mar. 14, 1978, Ser. No. 886,502

Claims priority, application Italy, Mar. 14, 1977, 12510 A/77; Oct. 3, 1977, 12789 A/77

Int. Cl.[2] E05B *67/22*

U.S. Cl. 70—34 **7 Claims**



1. A protected padlock, of the type presenting at least one straight shackle slidable in seats provided in at least two wings of the padlock body so as to be capable of closing a U-shaped recess defined by the said wings, and a cylinder lock comprising a cylinder rotatably housed in the said padlock body and acting on a latch pin housed in a bore provided in the padlock body, said cylinder cooperating with pin tumblers housed in bores provided in the said padlock body, wherein the improvement comprises an armour jacket made of hard material which is vested onto the side surface of the padlock body so as to close the said latch pin bore and the said pin tumblers bores, while realizing an outer protective casing for the padlock, said armour jacket being tubular and presenting a section which is substantially equal to the outer profile of the side surface of the padlock body, said armour jacket being blocked on the padlock body by means of an inwardly directed protuberance obtained on the said jacket and cooperating with a recess provided in the padlock body, by penetrating into same.

4,183,236

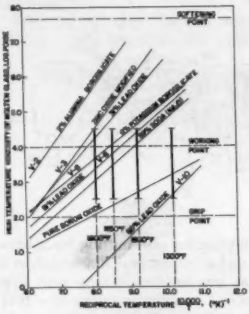
METHOD OF ISOTHERMAL FORGING

William D. Spiegelberg, Parma, and Donald J. Moracz, Garfield Heights, both of Ohio, assignors to TRW Inc., Clevelend, Ohio

Filed Jan. 30, 1978, Ser. No. 873,673

Int. Cl.[2] B21J *3/00*

U.S. Cl. 72—42 **16 Claims**



1. A method of isothermally forging a preheated metallic workpiece and a preheated die at a predetermined temperature above 500° F. and below about 1800° F. which comprises the step of interposing between the die and the workpiece a film of a forging lubricant comprising an amount in excess of 50% by weight of a fused vitreous composition having dispersed therein from 1% to 15% by weight of at least one finely divided infusible inorganic abrasive component having a melting point above the forging temperature and a hardness at room temperature of from 5.5 to 10 Mohs, said inorganic abrasive component having a particle size in the range of from 1 to 75 microns, and being nonreactive with the metal of the workpiece and the metal of the die at the forging temperature, and said inorganic abrasive component remaining as a separate dispersed phase in the fused vitreous composition.

4,183,237

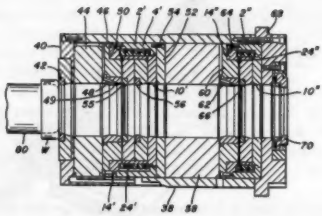
METHOD OF MAKING ALUMINUM CANS

Dennis A. Schaffer, Hendersonville, Tenn., assignor to Carmet Company, Pittsburgh, Pa.

Division of Ser. No. 827,908, Aug. 26, 1977, Pat. No. 4,109,502. This application Apr. 24, 1978, Ser. No. 899,603

Int. Cl.[2] B21D *22/00*

U.S. Cl. 72—349 **1 Claim**



1. The method of making aluminum cans or the like which comprises:

A. providing a die assembly having a plurality of carbide dies arranged in axial alignment, at least some of said dies being mounted in a floating ring surrounded by at least three segments mounted in a peripheral space, and a carbide disc bearing against the exit side of said die that is mounted in the floating ring;

B. pushing a can blank on a carbide punch through said dies to form a can;

C. removing said can from the dies; and

D. after removing said can from the dies, centering the dies mounted in the floating ring by resiliently urging the segments surrounding said floating ring inwardly toward stop means concentric with the normal axis of the dies.

4,183,238

DOUBLE ACTING PRECISION DEEP-STAMPING PRESS

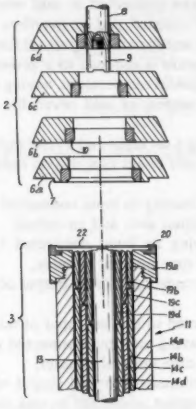
Edgard J. Maillet, Blanquefort, France, assignor to Agence Nationale de Valorisation de la Recherche (ANVAR), Neuilly sur Seine, France

Continuation of Ser. No. 651,440, Jan. 22, 1976, abandoned. This application Dec. 21, 1978, Ser. No. 971,758

Claims priority, application France, Jan. 24, 1975, 75 02291

Int. Cl.[2] B21D *22/28*

U.S. Cl. 72—349 **2 Claims**



1. A double-acting press for precision deep-stamping requiring a plurality of passes, comprising first and second tool assemblies, arranged in coaxial relationship facing one another and wherein the common axis of said first and second tool assemblies is vertical, said first tool assembly comprising a hollow stem, double-acting hydraulic stamping jack including a head having a free end, a plurality of angular pass dies equal in number to that of the passes required supported on said stamping jack head and having internal dimensions decreasing from the first pass die situated at the free end of said head, a male blank-cutting punch on the front leading surface of said first pass die, the spacing of the leading surfaces of two successive pass dies being at least equal to the height of the blank after it passes through the first of a pair of adjacent dies, a second hydraulic central, double-acting jack having a stem, said central jack being disposed in coaxial, operative relationship with said stamping jack with said stem passing coaxially through the hollow stem and the head of the stamping jack, said second tool assembly comprising a single-acting hydraulic retaining jack and including a plurality of coaxially arranged, telescopically disposed tubular punches equal in number to that of the pass dies of said first tool assembly aligned, respectively, with said male blank-cutting punch and the successive dies until the penultimate die, a central punch having a fixed central stem disposed within said tubular punches for the last pass whose end is arranged to cooperate with that of the stem of said central jack of said first tool assembly to grip the central part of the blank firmly during the entire deep-stamping process, said tubular punches being arranged to slide within one another around said central punch, said tubular punches including a plurality of telescopically arranged tubular pistons operatively associated with a respective one of said tubular punches, a plurality of interchangable tubular tools forming a working surface for the upper part of a respective one of said tubular punches, said interchangable tubular tools bearing on a corresponding respective tubular piston, said tubular punches being arranged so that they present their free ends at the level of the end of said fixed central stem of said central punch when said retaining jack is at the end of its active stroke.

4,183,239

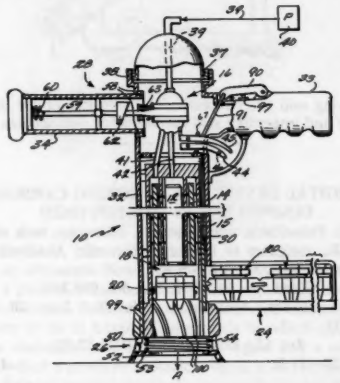
TWO-PIECE FASTENER AIR HAMMER

James H. Stubbings, Rockville, Md., assignor to Potomac Applied Mechanics, Inc., Bethesda, Md.

Filed Sep. 14, 1977, Ser. No. 833,338

Int. Cl.[2] B21J *15/34*

U.S. Cl. 72—391 **8 Claims**



1. A powered impacting device comprising:

a first, inner, piston;

a second, outer, piston concentric with said first piston;

means for receipt of two-piece fastener, having concentric inner and outer components, in operative relationship with said pistons so that said outer component is driven by said second piston, and said inner component is driven by said first piston, said means including a firing barrel;

means for supplying pressurized fluid to said pistons so that said second piston contacts said outer component and drives it axially in a given direction, and then said first piston contacts said inner component and drives it axially in the same direction, moving relative to said second piston, and causes said fastener outer component to pierce a workpiece and said fastener inner component to cam said outer component into locking engagement with the workpiece; and

means for automatically feeding fasteners into said firing barrel for firing thereof, out of said barrel.

4,183,240

METHOD AND APPARATUS FOR DETECTING PLY SEPARATIONS IN CARCASSES

Oddvar Kristiansen, Gjøvik, Norway, assignor to Svenska Slo Maskin AB, Karlstad, Sweden

Filed Dec. 14, 1977, Ser. No. 860,513

Int. Cl.[2] G01N *25/00*

U.S. Cl. 73—15 R **3 Claims**

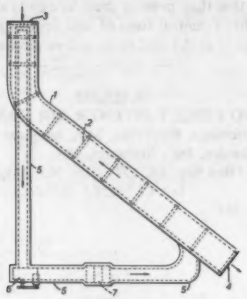
1. A method of detecting deficiencies such as ply separations in tire carcasses prior to retreading said carcasses, comprising the following steps:

entering and advancing said tire carcasses through a tunnel-like passageway;

directing a stream of hot gases through said passageway;

heating said tire carcasses within said passageway to a temperature in the range of substantially 110°-130° C. to

remove moisture from said carcasses as well as to magnify inherent deficiencies in said carcasses;



removing said tire carcasses from said tunnel-like passageway and inspecting said carcasses for deficiencies.

4,183,241

DIGITAL DEVICE FOR CHECKING CARBON EQUIVALENT IN MOLTEN IRON

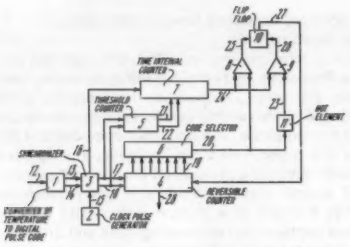
Leonid S. Fainzilberg, and Leonid S. Zhitetsky, both of Kiev, U.S.S.R., assignors to Institut Kibernetiki Akademii Nauk Ukrainskoi SSR, Kiev, U.S.S.R.

Filed Jun. 16, 1978, Ser. No. 916,366

Claims priority, application U.S.S.R., Jun. 20, 1977, 2500554[1]

Int. Cl.[2] G06F *15/20*; G01N *25/02*

U.S. Cl. 73—17 R **1 Claim**



1. A digital device for checking the carbon equivalent in molten iron, comprising:

a converter, which converts the actual temperature of a metal to a digital pulse code, having an input, whereto there is applied a signal carrying information on the actual temperature of the metal;

a first output for code pulses corresponding to a positive increment of temperature;

a second output for code pulses corresponding to a negative increment of temperature;

a clock pulse generator having an output;

a synchronization unit for time distribution of code and clock pulses, having;

a first input connected to the first output of said converter which converts the actual temperature of the metal to a digital pulse code;

a second input connected to the second output of said converter which converts the actual temperature of the metal to a digital pulse code;

a third input connected to said output of said clock pulse generator,

a first output for synchronized code pulses corresponding to a positive increment of temperature;

a second output for synchronized code pulses corresponding to a negative increment of temperature, and a third output for synchronized clock pulses;

a reversible counter for obtaining a parallel code of the carbon equivalent, having an add input connected to said synchronization unit;

a subtract input connected to said first output of said synchronization unit;

a count suppression input, and digit outputs;

a threshold counter for pulse formation when a predetermined increment of the temperature information signal takes place, having an add input connected to said second output of said synchronization unit;

a subtract input connected to said first output of said synchronization unit, and overflow outputs;

a time interval counter for selection of time intervals when predetermined increments of the temperature information signal takes place, having a count input connected to said synchronized clock pulse output of said synchronization unit, reset inputs connected to said overflow outputs of said threshold counter, and an overflow output;

a code selection unit for effecting signal formation when the metal temperature is reduced to a pre-set value with respect to the liquidus temperature, having inputs connected to said digit outputs of said reversible counter, and an output;

a flip-flop, having a set input and a reset input, and an output connected to said count suppression input of said reversible counter;

a NOT element, having an input connected to said output of said code selection unit, and an output;

a first gate, having an input connected to said overflow output of said time interval counter,

a control input connected to said output of said code selection unit; and

an output connected to said set input of said flip-flop; and

a second gate, having an input connected to said overflow output of said time interval counter;

a control input connected to said output of said NOT element, and an output connected to said reset input of said flip-flop.

4,183,242

DIGITAL TORQUE METER WITH REVERSE ROTATION AND VIBRATION DATA CORRECTION

Winthrop K. Brown, Bellaire, Tex., assignor to Texaco Inc., White Plains, N.Y.

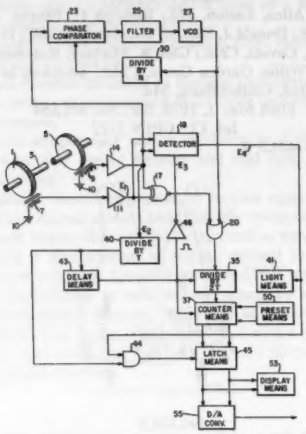
Filed Apr. 28, 1978, Ser. No. 900,963

Int. Cl.[2] G01L *3/10*

U.S. Cl. 73—136 A **18 Claims**

1. A torque meter for measuring the torque of a shaft comprising at least two sensing means affixed to the shaft and providing shaft pulse signals at the same frequency but having a phase difference corresponding to the torque of the shaft as the shaft rotates in a predetermined direction, means for providing clock pulses, means connected to both sensing means for detecting reverse rotation of the shaft and providing a detection signal, circuit means connected to the two sensing means, to the detecting means and to the clock pulse means for providing groups of clock pulses in accordance with the shaft pulse signals and the detection signal so that the number of clock pulses in each group corresponds to the torque of the

shaft when the shaft rotates in the predetermined direction, and indicating means connected to detecting means for indicating



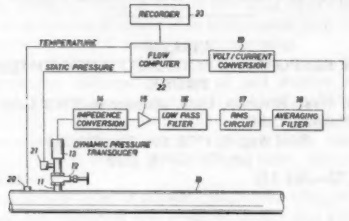
reverse rotation of the shaft in accordance with the detection signal.

4,183,243

GAS FLOW MONITOR

Maurice M. Patterson, and Krishnaswamy Srinivasan, both of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Oct. 16, 1978, Ser. No. 952,013
Int. Cl.² G01F *1/64*
U.S. Cl. 73—155 **6 Claims**



1. A method for determining the gas flow from a well comprising:

producing dynamic pressure fluctuations in the gas flow using fixed restrictions placed in the path of said gas flow;

measuring the dynamic pressure of the turbulent gas flow from said well and producing a related electric signal;

filtering the signal to remove high frequency fluctuations;

taking the RMS value of the filtered signal;

measuring the static pressure and temperature of the gas flow; and,

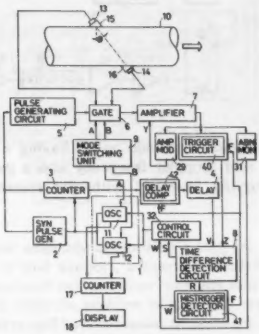
determining the flow rate of said gas from RMS value, static pressure divided by the temperature.

4,183,244

ULTRASONIC FLOW RATE MEASURING APPARATUS

Masaru Kohno; Yukio Nakagawa, and Takeo Kada, all of Kawasaki, Japan, assignors to Fuji Electric Co., Ltd., Kawasaki, Japan

Filed Jul. 26, 1978, Ser. No. 928,322
Claims priority, application Japan, Jul. 26, 1977, 52-89404
Int. Cl.² G01F *1/66*
U.S. Cl. 73—194 A **2 Claims**



1. In an ultrasonic flow rate measuring device of the type having a pair of transducers disposed oppositely on a pipe through which a fluid to be measured flows and controlled alternately to be in a transmitting mode in which an electric signal is converted into an acoustical signal and a receiving mode in which a received acoustical signal is converted into an electrical signal, an electrical pulse generating circuit for exciting the one of said transducers which is in the transmitting mode, two oscillation circuits whose oscillation frequencies can be varied, a counter which counts the output signal of each oscillation circuit and provides an output signal when the count value of said counter reaches a predetermined value, a delay element for providing a delay time to said output signal of said counter, and a time difference detection circuit responsive to the output signal of said delay element and to the output signal of the one of said transducers in the receiving mode, the improvement comprising:

(a) an abnormality monitoring circuit responsive to a signal H corresponding to the output of said receiving transducer for providing an output signal W when said signal H exceeds an abnormality monitoring voltage E_1;

(b) a trigger circuit for providing an output signal Z to said time difference detection circuit when said signal H exceeds a set voltage E_3 and for providing in response to a signal F said output signal Z to said time difference detection circuit when said signal H exceeds a set voltage E_{30}; and

(c) a mistrigger detection circuit for providing said output signal F when said output signal W is present and when a signal R from said time difference circuit exceeds a set voltage E_{61}.

4,183,245

SYNCHRONOUS FREQUENCY-TO-VOLTAGE CONVERTER FOR DOPPLER APPARATUS

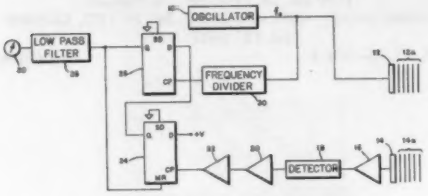
James G. Connery, Ambler; Louis D. DiNapoli, Colmar, both of Pa., and Giancarlo Punis, Sicklerville, N.J., assignors to Leeds & Northrup Company, North Wales, Pa.

Filed Oct. 23, 1978, Ser. No. 953,739
Int. Cl.² G01F *1/66*
U.S. Cl. 73—194 A **5 Claims**

1. In a Doppler meter in which the Doppler frequency is converted to a d.c. output signal representative of the rate of motion of a reflector the improvement for compensating said

d.c. output signal for changes due to changes in the transmitted signal comprising

pulse generating means responsive to said Doppler frequency and to said transmitted frequency to generate a



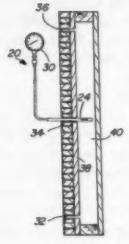
series of constant amplitude pulses having a frequency varying as said Doppler frequency and a pulse length duration varying inversely with said transmitted frequency.

4,183,246

INSULATION PRESENCE SENSING PROBE

Steven C. Reynolds, 30150 W. Nine Mile, Apt. 202, Farmington Hills, Mich. 48024

Filed Jun. 8, 1978, Ser. No. 913,664
Int. Cl.[2] G01F *23/14*
U.S. Cl. 73—290 R **4 Claims**



1. An insulation presence sensing probe comprising:

a pressure gauge having a pressure inlet;

a probe having sufficient length to permit said probe to be inserted through an opening in an external wall of a building into the space between said external wall and the internal wall of said building with a portion of said probe remaining outside said external wall;

said probe being of tubular construction and havng an aperture along a wall of said probe;

a pressure expandable member contained within said probe adjacent to said aperture;

a length of flexible tubing connecting said pressure inlet and said pressure expandable member;

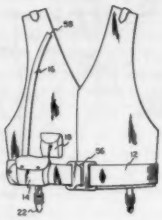
said pressure expandable member and said flexible tubing being pressurized above atmospheric pressure, said pressure expandable member and said flexible tubing being rotatably contained within said probe.

4,183,247

METHOD FOR SAMPLING AIR IN PROPORTION TO RESPIRATION

Richard T. Allen, Easton, Md.; Rudolph H. Moyer, West Covina, Calif.; Donald J. Sibbett, Cucamonga, Calif.; Howard H. Anderson, Covina, Calif.; Glen R. Martner, Rosemead, Calif., and Don Willis, Garden Grove, Calif., assignors to Geomet, Incorporated, Gaithersburg, Md.

Filed May 1, 1978, Ser. No. 901,654
Int. Cl.[2] G01N *1/22*
U.S. Cl. 73—421.5 R **1 Claim**



1. Method for sampling air in proportion to respiration comprising:

A. Supporting an air sampling monitor upon a respirant creature such that the open end of said monitor is adjacent the creature's mouth;

B. Pumping air through said sampler by expansion and contraction of the thoracic cavity during respiration, said pumping including drawing air through said air sampling monitor, as said thoracic cavity contracts during exhalation and exhausting air, as said thoracic cavity expands upon inhalation;

C. Gauging the amount of pollutants collected within said air sampling monitor, as a function of pollutant inhaled during a given period;

D. Generating electric signals proportionate to the volume of air being pumped during each respiration;

E. Accumulating said signals as a function of total volume of air being inhaled during a given period and displaying said accumulative signals in a digital readout of total air volume inhaled; and

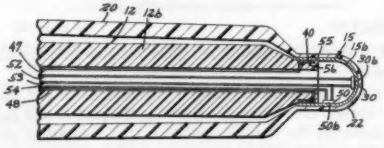
F. Correlating said digital readout of total air volume inhaled with the amount of pollutants collected in said air sampler, as a function of total pollutants inhaled.

4,183,248

FAST RESPONSE ELECTRONIC THERMOMETER PROBE

Roger A. West, Riverton, Utah, assignor to RWB Labs, Hacienda Heights, Calif.

Filed Aug. 8, 1978, Ser. No. 932,034
Int. Cl.[2] G01K *7/22*
U.S. Cl. 73—362 AR **10 Claims**



1. Fast response clinical temperature measurement apparatus of the type having a probe with disposable plastic probe covers, comprising:

an elongate probe member;

a high heat conductivity tip member;

means securing said tip member to an end of said probe;

a disposable plastic probe cover shaped to fit over said probe member and having a tip shaped and sized to conform to said tip member for maintaining close thermal contact between said tip member and a zone of a body whose temperature is to be measured;

a first temperature sensor mounted in close thermal contact with said tip member;

a heater element mounted in thermal communication with said probe end and spaced apart from said first temperature sensor;

a second temperature sensor mounted in a thermal path between said heater element and said first temperature sensor; and

energization means connected to receive signals from said first and second sensors and to supply energization current to said heater element, said energization means operable during a measurement to supply current to said heater element when the temperature of said first sensor exceeds the temperature of said second sensor by more than a predetermined amount, whereby said heater element supplies heat to the probe member during a measurement to prevent unwanted heat flow from the tip member down the probe member.

4,183,249

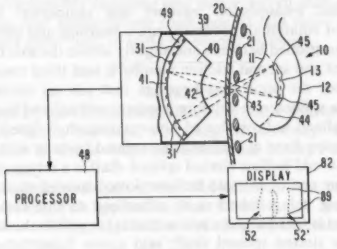
LENS SYSTEM FOR ACOUSTICAL IMAGING

Weston A. Anderson, Palo Alto, Calif., assignor to Varian Associates, Inc., Palo Alto, Calif.

Continuation of Ser. No. 556,506, Mar. 7, 1975, abandoned. This application Nov. 18, 1977, Ser. No. 852,755

Int. Cl.[2] G01N *29/00*

U.S. Cl. 73—626 **46 Claims**



1. An ultrasonic imaging system providing signals representative of an interior structure of an interrogated body to enable visual display thereof, said system comprising:

means for directing a plurality of ultrasonic beams in turn to respective different portions of said interior structure through an acoustic aperture of said body which is small relative to said interior structure, as well as returning the reflected ultrasonic energy resulting from each beam along a path similar to that of said beam, said means including

a side-by-side array of transducers for providing said beams and for translating said reflected energy into said electrical signals, and a homocentric acoustic lens positioned between said array and said interrogated body, said lens conveying said beam and ultrasonic energy, said lens having a center of curvature positioned near said aperture; and

means for actuating transducers of said array to generate said plurality of ultrasonic beams sequentially for conveyance through said lens and into said body, said transducers then translating ultrasonic energy reflected by said body into electrical signals representative thereof, whereby the interior of said body may be imaged with minimal aberration effects and with a wide sector angle despite a narrow imaging aperture.

4,183,250

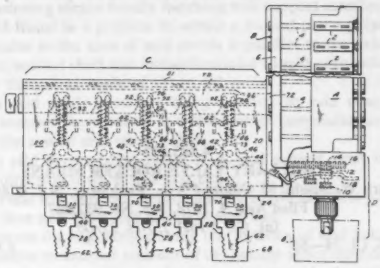
LOW PROFILE PUSHBUTTON TUNER

Robert Monath, and Russell D. Stamm, both of El Paso, Tex., assignors to General Instrument Corporation, Clifton, N.J.

Filed Dec. 19, 1977, Ser. No. 861,855

Int. Cl.[2] H03J *1/06*

U.S. Cl. 74—10.33 **20 Claims**



1. A tuner assembly comprising a support, a part movably mounted on said support, a tuner, an operative connection between said part and said tuner whereby said tuner is tuned in accordance with the position of said part, and a plurality of manually actuated keys mounted on said support and individually movable in a given direction between operative and inoperative positions, each of said keys having a cam thereon adjustably positionable about an axis, arms pivotally mounted on said support and operatively connected to said part, each cam, when its key is in operative position, engaging and pivoting the corresponding arm to position said part and thereby control the tuning of said tuner, said part being mounted on said support for movement in a straight line substantially at right angles to the direction of movement of said keys.

4,183,251

TIMER MECHANISM

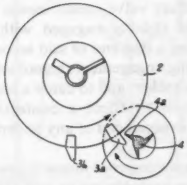
Jean Testemale, Paris, France, assignor to Societe Nouvelle des Appareils de Precision et Compteurs, Paris, France

Filed Mar. 6, 1978, Ser. No. 883,944

Claims priority, application France, Mar. 9, 1977, 77 06908

Int. Cl.[2] F16H *25/08*

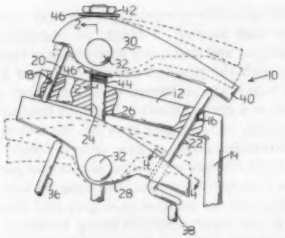
U.S. Cl. 74—54 **7 Claims**



1. A timer mechanism for controlling a thermostat having a control shaft, the mechanism comprising: a frame, a synchronous motor mounted in the frame, a first and second lever pivotably mounted on the frame so as to be able to take an operative and an inoperative position, cam motion transmission means operatively connected to the said motor so as sequentially to pivot the said first lever from its inoperative to its operative position, while pivoting the said second lever to its inoperative position, and from its inoperative to its operative

position, while pivoting the said second lever to its operative position, first transmission means operatively connected to said motor and controlled by the said first lever to rotate the said control shaft in a first direction when the said first lever is in its operative position, and second transmission means operatively connected to the said motor and controlled by the said second lever to rotate the said control shaft in the opposite direction of rotation when the said second lever is in its operative position.

4,183,252
ANCILLARY VALVE ROCKER MEANS
Mark W. Sossin, 85 Oakland Ave., Rockaway, N.J. 07866
Filed Aug. 9, 1978, Ser. No. 932,287
Int. Cl.[2] F16H *25/08, 35/08*
U.S. Cl. 74—55 **6 Claims**



1. For use with a standard valve rocker assembly which has a given valve rocker, and a push rod operable therewith for cyclically translating a valve rod, ancillary valve rocker means, comprising:

an ancillary valve rocker;

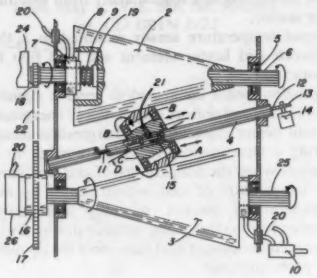
means for mounting said ancillary valve rocker atop a given valve rocker;

first rod means slidably engaged with said mounting means for causing a first end of said first rod means to effect a contacting engagement thereof with a first end of said ancillary rocker, and to cause a second end of said first rod means to effect a contacting engagement thereof with a first end of any underlying, given valve rocker atop of which said ancillary valve rocker means is mounted; and

second rod means slidably engaged with said mounting means for causing a first end of said second rod means to effect a contacting engagement thereof with a second end of said ancillary rocker, and to cause a second end of said second rod means to effect a contacting engagement thereof with an exposed end of any underlying valve rod; wherein

said mounting means comprises means supporting said ancillary valve rocker rockably on an axis lying intermediate said first and second ends of said ancillary valve rocker, and means disposing said first ends of said first and second rod means a first distance therebetween, and said second ends of said first and second rod means a distance therebetween which is less than said first distance, whereby a movement of such a first end of any given, underlying valve rocker through a given arc is converted into movement of said second end of said ancillary valve rocker through an arc greater than said given arc, to cause said second end of said second rod means to effect an exaggerated translation of any underlying valve rod with which said second rod means is engaged.

4,183,253
DUAL SURFACE ANGULAR POWER TRANSFER WHEEL TRACTION NIPPING DEVICE
Domenic Borello, 142 Nyac Ave., Pelham, N.Y. 10803
Filed Feb. 7, 1977, Ser. No. 766,363
Int. Cl.[2] F16H *15/16, 15/08*
U.S. Cl. 74—193 **13 Claims**



1. In a dual surface angular power transfer wheel traction direct drive nipping infinitely variable speed drive, a pair of first and second truncated friction members set within a case and mounted for rotational and linear movement upon splined shafts; said splined shafts being mounted upon fixed axes within said case; said first and second friction members being engaged for transmission of rotation from one to the other, and being also shiftable along their axes in a line oblique to the tangential plane of contact; between said first and second friction members a third transmission member and connected means mounted for rotational movement upon bearings and having a fixed axis positioned between and slightly above the axis line of the said first and second friction members; said third transmission member set upon said bearings that are set upon and carried by a splined non-rotating housing; said splined housing having a splined hollow slotted non-rotating shaft fitted to it; said shaft being fixed at both ends by splined bores in said case; fitted within said hollow slotted splined shaft is a return spring linked at one end of the said hollow slotted splined shaft; said return spring being linked at its other end to one end of a member that is fitted about a screw that rides withih the slot of said hollow slotted splined shaft; said screw being threaded into said splined non-rotating housing; attached to the other end of said member that is fitted about said screw is one end of a speed change sprocket; the other end of said speed change sprocket is linked to a speed change sprocket; said sprocket being fixed to a shaft of a servo motor; said servo motor set upon a base and fixed to the outer side of said case; said first shiftable rotatable friction member having a splined bore that is fitted to the first splined shaft; said first shaft having fitted about it a splined bored sprocket that is located on the outside of said case and that is connected for transmission of rotation by a chain to a second sprocket that is fixed upon the drive side of a one way clutch and located on the outside of said case; the slip side of said one way clutch having a splined bore that is fitted to a second splined shaft that is fitted into the splined bore of the said friction member mounted for linear rotatable movement upon a fixed axis and set within said case.

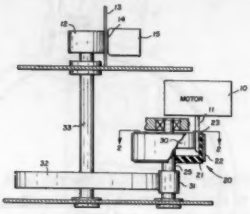
4,183,254
DRIVE REDUCER FOR TAPE RECORDER
David M. Good, Rochester, N.Y., assignor to Tapecon, Inc., Rochester, N.Y.
Filed Dec. 15, 1977, Ser. No. 860,749
Int. Cl.[2] F16H *13/02, 55/32;* **F16D** *69/00*
U.S. Cl. 74—206 **6 Claims**

1. A drive reducer for a tape recorder having a motor, a shaft driven by said motor, a driven element, a reducer shaft, a

generally cup-shaped element fixed to said reducer shaft and having a cylindrical outer wall with a radially inner surface formed of a friction material and positioned to engage said motor-driven shaft, and means for transferring rotation of said reducer shaft derived from said motor-driven shaft and said cup-shaped element to said driven element, said drive reducer comprising:

a. an idler wheel concentric with said cup-shaped element and arranged within said outer wall of said cup-shaped element;

b. said idler wheel being freely rotatable on said reducer shaft;



c. said idler wheel having a radius slightly larger than the distance from the axis of said reducer shaft to the surface of said motor-driven shaft to leave an annular space narrower than the diameter of said motor-driven shaft between said idler wheel and said outer wall of said cup-shaped element; and

d. said idler wheel being formed of compressible material compressibly engaging said motor-driven shaft and pressing said motor-driven shaft against said inner surface of said outer wall of said cup-shaped element.

4,183,255

BICYCLE WITH DERAILLEUR ARRANGEMENT

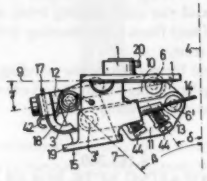
Berndt Leiter, Werneck, Fed. Rep. of Germany, assignor to Fichtel & Sachs AG, Schweinfurt am Main, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 635,692, Nov. 26, 1975, abandoned. This application Dec. 13, 1976, Ser. No. 750,221

Claims priority, application Fed. Rep. of Germany, Dec. 16, 1974, 2459341

Int. Cl.[2] F16H *9/24, 11/08*

U.S. Cl. 74—217 B **13 Claims**



1. In a bicycle including a frame, a first shaft and a second shaft on said frame having respective axes and carrying a first wheel and a second wheel respectively for rotation about said axes; said first shaft being movable on said frame toward and away from a position in which said axes are parallel; said wheels in said position of said shafts defining a first plane tangential to each of said wheels and spaced from said frame, and a family of lines perpendicular to said tangential plane; chain drive means on said frame including a drive chain; a plurality of sprocket wheels having different respective numbers of teeth and coaxially secured to said second wheel; and a derailleur arrangement including a guide sprocket engaging said drive chain and mounted on said frame for alternatively training said drive chain over said sprocket wheels; the improvement in the derailleur arrangement which comprises:

(a) a four-bar linkage including a support member, two link members, a coupler member, and four pivots having parallel axes, the first and second one of said pivots securing said support member to said link members respectively, and the third and fourth pivots respectively securing said coupler member to said link members; and

(b) fastening means fixedly fastening said support member to said frame in a position in which a second plane perpendicular to the axes of said pivots is parallel to the axis of said second shaft and inclined relative to said perpendicular lines at an angle of 15° to 45°,

(1) said guide sprocket being secured to said coupler member for rotation in a third plane perpendicular to the axis of said second shaft,

(2) said pivots being offset from said second shaft in a direction toward said first plane,

(3) said first and second pivots being nearer said first plane than said third and fourth pivots; and

(c) means for angularly moving one member of said linkage relative to another member of the linkage about the axis of the pivot connecting said one member to said other member and including

(1) an elongated tension member engaging said one member at a point radially spaced from said last-mentioned axis, and

(2) means varying the radial spacing of said point from said last mentioned axis in response to said angular moving.

4,183,256

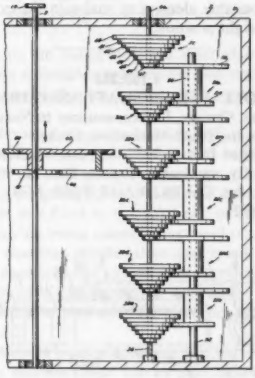
VARIABLE RATIO ANGULAR SPEED CONVERTER

Arnold St. J. Lee, Red Bank, N.J., assignor to Milstein Medical Research Foundation, Inc., New York, N.Y.

Division of Ser. No. 750,189, Dec. 13, 1976, Pat. No. 4,085,747. This application Jan. 5, 1978, Ser. No. 867,040

Int. Cl.[2] F16H *3/32*

U.S. Cl. 74—349 **4 Claims**



1. In an apparatus for effecting an angular speed conversion between a first input shaft and a second output shaft, the conversion effecting apparatus comprising, in combination, a plurality of gear clusters each having a plurality of gears fixedly disposed in successive, axially spaced concentric relation, the successive gears in each cluster having progressively smaller numbers of teeth, means for fixedly mounting a first one of the clusters to the first shaft, a third shaft, means for independently and successively mounting each of the remaining clusters for rotation on the third shaft in an axially spaced relation, means coupling the first cluster to an initial one of the remaining clusters in the succession on the third shaft for imparting an

angular speed reduction of a prescribed nominal ratio between the first cluster and the initial cluster on the second shaft, a plurality of means each coupled between one of the clusters on the third shaft and the next-succeeding one of the clusters on the third shaft for imparting an angular speed reduction of said nominal ratio between the associated clusters, and speed ratio selection means carried on the second shaft for engaging an arbitrary one of the gears of any of the gear clusters on the first and third shafts.

4,183,257

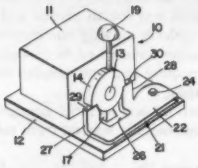
SAFETY DEVICE FOR LOCKING THE POSITION OF A LEVER ARM

Timothy J. Lovenduski, Force, Pa.

Filed Feb. 24, 1978, Ser. No. 880,995

Int. Cl.[2] G05G *5/04*

U.S. Cl. 74—475 **12 Claims**



1. A safety device for attachment to and locking the position of a control mechanism having a rotatable element with projecting stop portions, the safety device comprising a body having means at one end for pivotally mounting the body to the mechanism near the rotatable element and having a recess located centrally on one side of the body adapted to fit beneath the rotatable element, the device having a pair of upwardly projecting fingers, one finger on each side of the recess, each of the fingers having a bevelled edge portion on the side of the finger adjacent to the recess adapted to fit on each side of the rotatable element, the fingers adapted to engage the stop portion of the rotatable element to maintain the control mechanism in its upright position.

4,183,258

COLLAPSIBLE SHAFT ASSEMBLY

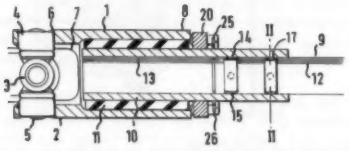
Gerard Stephan, Croissy, France, assignor to Nadella, & French Body Corporate, Rueil-Malmaison, France

Filed Dec. 7, 1977, Ser. No. 858,169

Claims priority, application France, Dec. 20, 1976, 76 38263

Int. Cl.[2] B62D *1/18*; F16D *3/76*

U.S. Cl. 74—492 **17 Claims**



1. A collapsible rotatable shaft assembly comprising an outer sleeve forming part of a universal coupling, an inner sleeve coaxially received in said outer sleeve, an elastomeric sleeve coaxially disposed in a space between said inner and outer sleeves in radial compression between said inner and outer sleeves, a shaft non-rotatably coupled to and axially slideable within said inner sleeve and a shearable lock to hold said shaft axially in position relative to said inner sleeve up to a given, minimum axial load.

4,183,259

WHEEL STRUCTURE ADAPTED TO SPIN AT HIGH ANGULAR VELOCITIES AND METHOD OF MANUFACTURING THE SAME

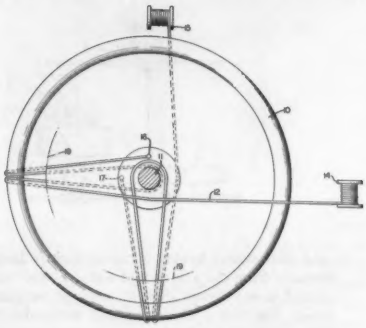
Jean-Luc Giovachini; Jean-Pierre Pascal, both of Paris, and Dante M. Vendramini, Asnieres, all of France, assignors to Institut de Recherche des Transports, Arcueil and Dante Marc Vendramini, Asnieres, both of, France

Continuation-in-part of Ser. No. 605,873, Aug. 19, 1975, abandoned. This application May 17, 1977, Ser. No. 797,659

Claims priority, application France, Aug. 22, 1974, 74 28905

Int. Cl.[2] F16C *15/00*

U.S. Cl. 74—572 **8 Claims**



1. A wheel structure suitable for spinning at high angular velocities comprising

a hub,

a rim concentrically extending around said hub,

first and second faces on opposite sides of a median plane containing said hub and said rim,

at least two cable lengths, each extending repetitively between said hub and said rim,

each of said cable lengths repetitively wound to pass twice around said rim and once around said hub for each cycle of wound cable,

each said pass around said hub maintained in the same said face and each said pass around said rim extending said cable length from one of said faces into the other of said faces,

an annular crossover zone extending concentrically between said hub and said rim,

said cable lengths having their portions extending between said hub and said rim each passing from one of said faces to the other of said faces when passing through said annular crossover zone,

at least one flange formed from the winding of said at least two cable lengths joining said hub and enveloping said rim to form a balanced assembly.

4,183,260

TOOL FOR ROTATING NUTS, BOLTS AND LIKE FASTENERS

Paul-Heinz Wagner, Much-Birrenbachshohe; Karl-Richard Hirtsiefer, Neunkirchen, and Johann Müller, Much-Nesshoven, all of Fed. Rep. of Germany, assignors to Paul-Heinz Wagner Maschinenfabrikation, Much-Birrenbachshöhe, Fed. Rep. of Germany

Filed Jun. 17, 1977, Ser. No. 807,526

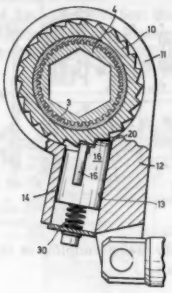
Claims priority, application Fed. Rep. of Germany, Jul. 14, 1976, 2631554; Jul. 14, 1976, 2631555; Dec. 31, 1976, 2659798

Int. Cl.[2] G05G *1/00*

U.S. Cl. 74—575 **19 Claims**

14. A rotary tool comprising a driving member having a general axis of rotation, a lever mounted for oscillatory movement generally about said axis, said driving member having

ratchet teeth arranged about the periphery thereof, a pawl carried by said lever for one-way driving engagement with said ratchet teeth, and a tension-applying means connected to



said lever and at least partially surrounding said driving member for frictionally gripping said driving member in response to driving engagement of said ratchet teeth by said pawl during movement of said lever in a driven member rotating direction.

4,183,261

SHACKLE

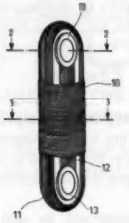
Max Eiselbrecher, Unterpfaffenhofen; Rolf Gunther, Munich, and Helmut Jakob, Zorneding, all of Fed. Rep. of Germany, assignors to Messerschmitt-Bolkow-Blohm GmbH, Munich, Fed. Rep. of Germany

Filed Dec. 19, 1977, Ser. No. 861,692

Claims priority, application Fed. Rep. of Germany, Dec. 21, 1976, 2657832

Int. Cl.[2] **G05G** *1/00;* **A44B** *21/00*

U.S. Cl. 74—579 R **17 Claims**



1. A shackle comprising metal insert means that comprises a pair of spaced eye bushings, pressure core means engaging and extending between said bushings spacing said metal insert means, and tension loop means holding the metal insert means and the pressure core means together, said pressure core means and said tension loop means being made of fiber compound materials, said pressure core means and said tension loop means of said fiber compound materials comprising fiber windings, said fiber windings of said loop means passing around both bushings and extending tangentially away from said bushing parallel to each other, the parallel portions of said loop means engaging and being parallel to said core means wherein the individual fibers extend in the direction of the force to be taken up by the respective fiber winding, whereby said pressure core means take up substantially only compressive forces, and said tension loop means take up substantially only tension loads.

4,183,262

GEAR CRANK FOR A BICYCLE

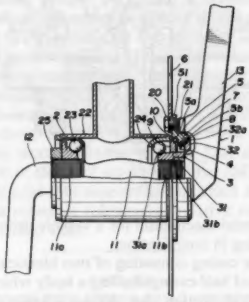
Takashi Segawa, Sakai, Japan, assignor to Shimano Industrial Company Limited, Osaka, Japan

Filed Jul. 19, 1976, Ser. No. 706,373

Claims priority, application Japan, Aug. 1, 1975, 50-107782[U]; Nov. 21, 1975, 50-159204[U]; Nov. 21, 1975, 50-159205[U]

Int. Cl.[2] **B62M** *3/00;* **F16D** *23/00*

U.S. Cl. 74—594.2 **1 Claim**



1. A gear crank for a bicycle, said gear crank comprising:

an integral crank body comprising:

a crank shaft, and

a crank arm connected to each end of said crank shaft, one of said crank arms being of an external size smaller in diameter than said crank shaft, the other of said crank arms being of an external size in diameter greater than said crank shaft and having at the connecting portion to said crank shaft an inner end face extending radially outwardly of said shaft,

said crank shaft being externally threaded at each end thereof;

said threads on the end of the crank shaft adjacent the crank arm having a diameter greater than said crank shaft being larger than the threads on the other end of said crank shaft;

internally threaded cones for bearing balls, said cones being screwed onto said externally threaded ends of said crank shaft;

an inner ring integrally formed as an axial extension of one of said cones and fixed to one axial end of said crank shaft, said inner ring being passable over said one crank arm of external diameter smaller than said crank shaft, so that said one cone screwed to said shaft urges said inner ring at one axial end of said shaft to be fixed to the inner end face of said crank arm of external diameter greater than said crank shaft;

a pair of bearings each including a pair of ball races confining balls therebetween, one of said bearings having an associated bearing race formed integrally with said inner ring;

a cylindrical driven member;

at least one sprocket wheel secured to said cylindrical driven member;

said inner ring supporting, at the outer periphery thereof, said cylindrical driven member through said pair of bearings in freely rotatably relation; and

a unidirectional rotation transmission, between said inner ring and said cylindrical driven member, for transmitting rotation of said crank shaft to said cylindrical member in only one direction of rotation.

4,183,263

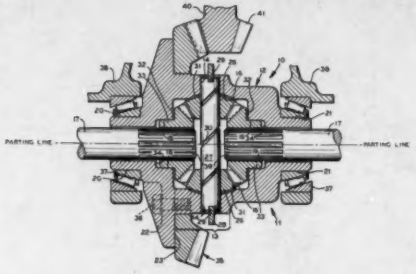
DIFFERENTIAL MECHANISM

Carl D. Osenbaugh, Fort Wayne, Ind., assignor to Dana Corporation, Toledo, Ohio

Continuation of Ser. No. 701,581, Jul. 1, 1976, abandoned. This application Mar. 6, 1978, Ser. No. 883,923

Int. Cl.[2] F16H *57/02, 1/38*

U.S. Cl. 74—606 R **4 Claims**



1. A differential mechanism for a vehicle drive, said mechanism comprising in combination:

(a) A hollow casing consisting of two identical half-casings, each of said half-casings having a body which consists of:

(1) a central portion that defines a space for a pair of differential pinions and for semi-circular halves of a pair of differential gears, said central portion being generated around the center line of oppositely extending vehicle half-axles and having a semi-cylindrical exterior,

(2) a tubular half-trunnion extending co-axially with and at each end of said central portion,

(3) a radial aperture at the pole of said central portion, and

(4) a semi-annular ring gear mounting flange on the exterior of said half-casing adjacent the semi-cylindrical portion thereof;

(b) a differential pinion mounting pin extending across the center line of the half-axles with its ends protruding into said radial polar apertures of said half-casings when said casing is assembled;

(c) a pair of differential pinions on said mounting pin;

(d) a pair of differential gears meshed with said pinions and positioned interiorly of said assembled casing;

(e) a pair of trunnion bearings each circumjacent a trunnion formed by said half-trunnions when said casing is assembled; and

(f) a ring gear closely circumjacent the cylindrical exterior of the assembled casing formed by said semi-cylindrical exteriors and drivingly connected to said mounting flange, whereby said two half-casings are held in assembled relationship by said trunnion bearings and said ring gear.

4,183,264

HYDROMECHANICAL TRANSMISSIONS HAVING ONE-WAY DEVICES TO BRIDGE EFFICIENCY DISCONTINUITIES

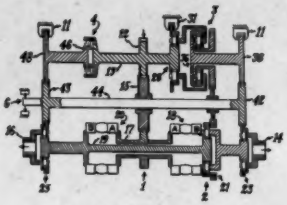
Bradley O. Reed, Pittsfield, Mass., assignor to General Electric Company, Schenectady, N.Y.

Filed Feb. 12, 1976, Ser. No. 657,456

Int. Cl.[2] F16H *37/06, 47/04*

U.S. Cl. 74—720.5 **19 Claims**

1. In a multirange hydromechanical transmission wherein shifting is accomplished by the release of gear element engaging means controlling one propulsion gear range and by the application of gear element engaging means controlling another gear range and wherein there is a discontinuity of output power and efficiency at the shift point between propulsion ranges with an excess of power in the lower range and less power in the higher range which is insufficient with respect to critical loads, the improvement comprising incorporation of a one-way element to provide self releasing gear reaction to



bridge said discontinuity when running in the higher range under those critical loads.

4,183,265

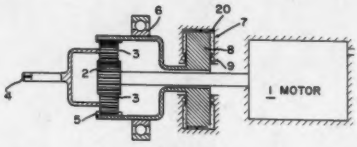
CONTROLLED TORQUE AIR MOTOR

Reginald W. Pauley, Belle Mead, N.J., assignor to Ingersoll-Rand Company, Woodcliff Lake, N.J.

Continuation of Ser. No. 687,329, May 17, 1976, abandoned, which is a continuation of Ser. No. 523,173, Nov. 12, 1974, abandoned. This application Dec. 27, 1977, Ser. No. 864,740

Int. Cl.[2] F16H *3/44*

U.S. Cl. 74—786 **10 Claims**



1. A torque applying apparatus comprising:

a motor having pulsating torque output;

power conversion means connected to said motor for adapting said motor output to the desired output torque and rotational speed;

an output spindle connected to said power conversion means;

said power conversion means having active elements for transmitting torque and rotation to said output spindle and a rotatively mounted passive element forming a reaction base for said active elements;

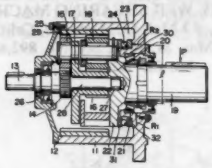
means for restraining the rotation of said rotatively mounted passive element in proportion to an increase in output torque within said power conversion means thereby allowing the pulsating torque output of the motor to be continuously applied after said output spindle has stalled; and

said means for restraining the rotation being operatively connected to said passive element of said power conversion means to thereby allow said passive element to rotate at a speed proportional to torque output without addition to the inertial content of the active elements of the drive train.

4,183,266
SHAFT SUPPORTING APPARATUS FOR PLANETARY GEAR REDUCTION DEVICE

Sinzi Osumi, Toyama, Japan, assignor to Kabushiki-Kaisha Fujikoshi, Toyamaken, Japan

Filed Apr. 13, 1977, Ser. No. 787,053
Claims priority, application Japan, Apr. 14, 1976, 51-45537[U]
Int. Cl.² F16H 1/28
U.S. Cl. 74—801 7 Claims



1. In a shaft supporting apparatus for a planetary gear reduction device, said planetary gear reduction device including a housing; a driving shaft having a gear secured thereto rotatably mounted within said housing; a planetary gear assembly disposed within said housing, said planetary gear assembly meshing with the gear secured to said driving shaft; and a driven shaft having a flange secured thereto disposed within said housing, said flange being coupled to said planetary gear assembly for rotation of said driven shaft through said planetary gear assembly when a rotating force is applied to said driving shaft; the improvement comprising:

a tapered bearing for supporting said driven shaft, the outside surface of said tapered bearing being secured within a counterbored recess of said housing and the inner bore of said tapered bearing being journaled on said driven shaft, and

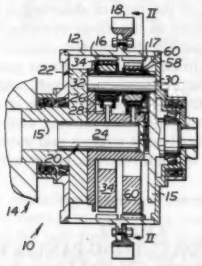
a thrust bearing disposed between a radially extending wall of said flange and a radially extending interior wall of said housing, and comprising

a pair of thrust bearing rings secured to said two walls respectively and extending substantially in a radial direction from the axis of said driven shaft, said driven shaft being supported in the presence of a radial force applied thereto by both said tapered and thrust bearings.

4,183,267
NESTED BEARING CRANK MECHANISM

George J. Jackson, Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Jul. 10, 1978, Ser. No. 922,945
Int. Cl.² F16H 1/28
U.S. Cl. 74—804 7 Claims



1. In a rotating assembly (22) having a first member (30) having an axis (36) and an outer surface (38), a second annular member (32) having a first central axis (40), a first axis of rotation (42) and inner and outer surfaces (44,46) and being positioned about said first member (30), said first axis of rotation (42) being substantially the same as the first member axis (36), said first central axis (40) being spaced a first preselected distance (47) from said first axis of rotation (42), a first bearing element (48) positioned between said first member (30) and said second annular member (32), a third annular member (34) having a second central axis (50) and an inner surface (52) and being positioned about said second annular member (32) and a second bearing element (56) positioned between said second and third annular members (32,34), the improvement comprising:

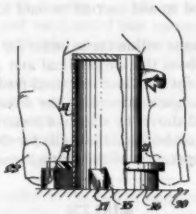
said first bearing element (48) being in continuous contact with and about the entire periphery of the outer surface (38) of the first member (30) and the inner surface (44) of the second annular member (32), said first bearing element (48) supporting said second annular member (32) in rotatable relationship relative to said first member (30); and

said second bearing element (56) being in continuous contact with and about the entire periphery of the outer surface (46) of the second annular member (32) and the inner surface (52) of the third annular member (34), said second bearing element (56) supporting said third annular member (34) in rotatable relationship relative to said second annular member (32).

4,183,268
DEVICE FOR REPLACING SPRINGS

Jerome E. Anderson, Box 186 E, Rte. #2, Lewes, Del. 19958

Continuation of Ser. No. 724,289, Sep. 20, 1976, abandoned. This application Jun. 14, 1978, Ser. No. 915,374
Int. Cl.² B23P 19/04
U.S. Cl. 81—3 R 4 Claims



1. Apparatus for use by a person in replacing a spring in a device, such as a chain saw, which apparatus comprises a cylindrical body which is hollow at one end which has an inside diameter larger than the arbor around which said spring is to be positioned;

at said end of said cylindrical body, anchor means to hold one end of said spring in place during the winding of said spring around the outer walls of said body at said end, said wall being substantially smooth to afford ready sliding of the wound spring off said body when said end of said body and said wound spring are positioned for placement of said spring about said arbor; and

an element slidable on said cylindrical body which element comprises a ring-like element having an inside diameter slightly larger than the outside diameter of said cylindrical body and being freely movable to bring it into and out of operative contact with a spring wound around said outer walls of said body at its said end and when in operative contact with said spring being capable of being readily held by a hand of the user while the resultant assembly is brought into replacement position of said spring about said arbor in said device, said slidable element comprising a disk the majority of which fully covers the spring coil wound on said body but having indentations which permit fingers of said person to contact the sides of the coil to

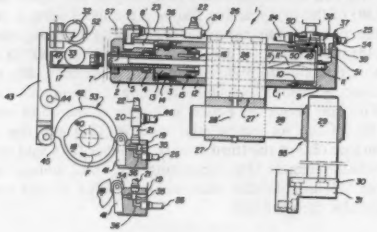
prevent it from unwinding as said person moves the coil into position for replacement.

4,183,269

RECOVERY DEVICE FOR PARTS FOR AUTOMATIC LATHES OR ANALOGOUS DEVICES

Michel Molliex, Thyez-Cluses, France, assignor to Ardex S.A., Cluses, France

Filed May 23, 1978, Ser. No. 908,893
Claims priority, application France, May 31, 1977, 77 16562
Int. Cl.² B23B *3/00, 3/36*
U.S. Cl. 82—2.5 **12 Claims**



1. An automatic device for recovering parts without surface damage from a cutting machine, the device comprising:

An elongate, closed cylinder having a front and a rear fluid inlet port at each opposite end;

A piston slideable in said cylinder between forward and rearward positions of the piston and extending outwardly from said cylinder at a forward one of said ends;

A shovel affixed to and carried on said forward end of the piston;

Piston guide means within the cylinder for turning the piston and shovel about the longitudinal axis during movement between said forward and rearward positions thereof; and

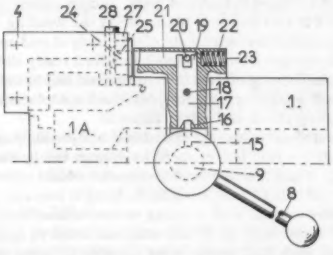
A fluid control means governing the direction of motion of the piston and shovel by selective metering of pressurized fluid to one or both of the cylinder fluid inlet ports in response to operation of the cutting machine.

4,183,270

DEVICE FOR CHANGING AND FIXING TOOLS QUICKLY

Charles Castagne, 65 100 Pareac, France

Filed Mar. 6, 1978, Ser. No. 883,624
Claims priority, application France, Mar. 25, 1977, 77 08937
Int. Cl.² B23B *29/24*
U.S. Cl. 82—36 A **2 Claims**



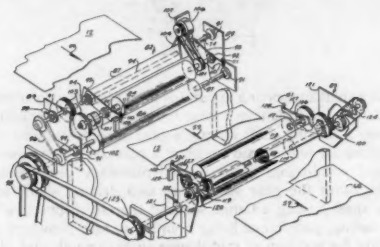
1. In a device for changing and fixing tools quickly, notably for lathes, of the kind having a fixed turret-head, a turret mounted rotatably on said turret-head, and one or more removable tool-holders fixed on said turret, the improvement that the turret is carried on a conical nose of said turret-head, that said tool-holder(s) is/are provided with centring means to receive a centring pin, and that means are housed in the turret-head both to centre one of the tool-holders in its operating position and to lock the turret in an angular position corresponding to said operating position, and wherein each tool-holder is equipped with centring means consisting of an adjusting eccentric integral with the tool-holder mounted in a two-part element whose sliding in a groove compensates for the linear movement of the rod of the eccentric in an axis radial to the turret.

4,183,271

ROTARY WEB SHEARING MACHINE

Merrill D. Martin, #2 Mall Ct., Oakland, Calif. 94611

Filed Mar. 31, 1978, Ser. No. 892,430
Int. Cl.² B23D *25/12*
U.S. Cl. 83—156 **14 Claims**



1. In a rotary shear machine for shearing sheets from a continuously moving web,

including

a rigid frame,

a pair of shear cylinders rotatably supported on said frame,

coacting shear blades on said cylinders,

driving means to rotate said cylinders opposite to one another such that the opposite shear blades shear across said web moving between said cylinders,

the improvement comprising

means to control the rotation of said cylinders to a speed at the time of shearing equal to the velocity of the web moving between said cylinders,

an upper feed roller and a lower feed roller having axes perpendicular to the direction of travel of said web,

said feed rollers being in the proximity of said cylinders and upstream relatively to the direction of movement of said web,

digital pulse generating means coupled to said upper feed roller for generating electrical pulse signals bearing a predetermined relationship to the velocity of rotation of said upper roller, said electrical signals being received and processed by said control means for the rotation of said pair of cylinders, at the time of shearing at the same circumferential velocity as the linear velocity of said web,

drive means for rotatably driving the upstream lower feed roller responsive to an electrical current generated by an upstream component engaging said web, said drive means rotating said upstream lower feed roller at the same circumferential velocity as of said moving web whereby said upstream feed roller tensile stresses said moving web, said upper feed roller being a follower roller when in contact with said web.

4,183,272

MECHANISM FOR CUTTING PANELS TO SIZE

Ludwig Striebig, Grossmatte, CH-6014 Littau, Switzerland

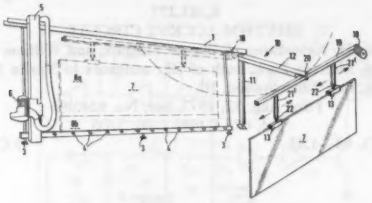
Filed Apr. 11, 1978, Ser. No. 895,518
Int. Cl.² B27B *5/06*
U.S. Cl. 83—411 R **12 Claims**

1. In a mechanism for cutting panels having a vertically

extending backing structure for backing a panel to be cut, a horizontally extending lower panel edge support, said structure and said support defining a working area, a carrier movably guided on said structure and carrying a saw unit for movement of the saw unit in said work area, and securing means for securing said panel in said work area, the improvement in the securing means which comprises:

(a) an elongated, cantilver arm having one longitudinal end portion mounted on said structure outside said work area; and

(b) gripping means mounted on the other longitudinal end portion of said arm, said gripping means being upwardly spaced from said lower edge support for gripping an upper edge of said panel in said work area,



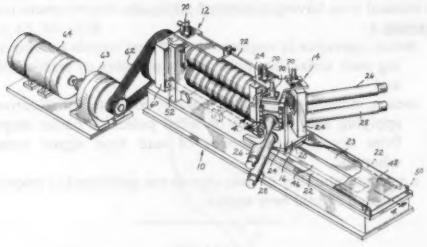
said one end portion being mounted on a portion of said structure horizontally spaced from said work area for pivoting movement about a vertical axis, said gripping means including an elongated cross bar member mounted on said other end portion for movement about a vertically extending axis, a plurality of gripper elements mounted on said cross bar member for longitudinal movement thereon relative to each other, and lifting means for jointly raising and lowering said gripper elements relative to said cross bar, said lifting means including a lifting drive mounted on said cross bar, and a tension member extending along said cross bar and connecting said drive to said elements.

4,183,273

SLITTER HAVING PIVOTAL MULTIPLE SPACED PAIRS OF ARBORS

James G. Greinke, Round Lake Beach; Douglas S. Matsunaga, Vernon Hills, and Eric W. Mosquera, Schaumburg, all of Ill., assignors to Braner Enterprises, Inc., Schiller Park, Ill.

Filed Apr. 10, 1978, Ser. No. 894,741
Int. Cl.[2] B26D *1/24;* B23D *19/04*
U.S. Cl. 83—479 **10 Claims**



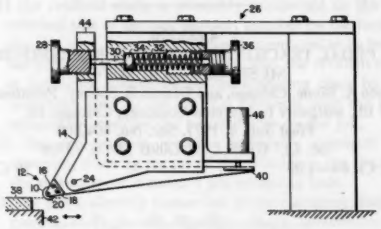
1. In a slitter including a frame, first and second spaced bearing housings, carried by said frame, multiple spaced pairs of arbors carried by said first bearing housing, each pair of arbors journaled at one end within said first bearing housing, each arbor adapted to carry removable cutters, the improvement comprising support means mounting said first bearing housing for rotational movement about a vertical axis reletive to said frame, means for shifting said support means toward and away from said second bearing housing, each pair of arbors being alignable with said second bearing housing upon pivotal movement of said first bearing housing, the outer ends of each pair of arbors being journaled within said second bearing housing when said arbors are aligned with said second bearing housing and said first bearing housing is shifted toward said second bearing housing, whereby said pairs of arbors so journaled within said second bearing housing may be utilized for one slitting operation and simultaneously therewith another pair of arbors may be fitted with cutters for use in a subsequent slitting operation.

4,183,274

ROLLER SCRIBER APPARATUS FOR SCRIBING GLASS

John T. Kingsley, Tempe, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 27, 1977, Ser. No. 865,045
Int. Cl.[2] B26D *3/08*
U.S. Cl. 83—886 **4 Claims**



1. Scribing apparatus having a scribing wheel rotatably mounted on an axle and mechanical bias means for applying a force orthogonal to said axle wherein the improvement comprises:

L-shaped means having a pivot at the apex thereof, said means comprising a vertically extending arm and a horizontally extending arm;

said wheel being attached at the outside of said apex, on the opposite side of said pivot from said horizontally extending arm;

said bias means coupled to the end of said vertically extending arm for controlling the force on said wheel and for counteracting the torque of said L-shaped member about said pivot; and

means for controlling the maximum dimensional interference between the surface to be scribed and the perimeter of said wheel such that a plane parallel to said axle and tangent to said wheel is parallel to and below the nominal location of the surface to be scribed.

4,183,275

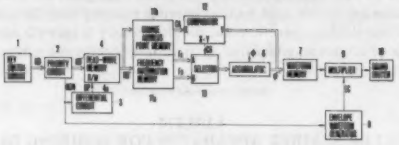
ELECTRONIC MUSICAL INSTRUMENT

Koji Niimi, and Mitsumi Kato, both of Hamamatsu, Japan, assignors to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Oct. 24, 1978, Ser. No. 954,237
Claims priority, application Japan, Oct. 26, 1977, 52/127633
Int. Cl.[2] G10H *1/00, 5/00*
U.S. Cl. 84—1.01 **3 Claims**

1. An electronic musical instrument comprising a keyboard provided with a plurality of keys for respective tone pitches, means for generating a plurality of frequency informations corresponding to the tone pitch of depressed one of said keys, selecting means for selecting one at a time of said plurality of frequency informations produced by said frequency information generating means, accumulating means for repeatedly accumulating the frequency information selected by said selecting means to produce a progressing accumulated value, a waveform memory device which is adapted to store amplitude

values at successive sampling points in one period of a waveform utilized to form a desired musical waveform and which is addressed with said progressing accumulated value from the accumulating means, control means for switching the selecting operation of said selecting means during the accumulating



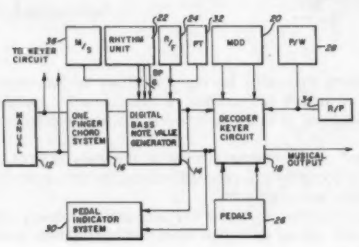
operation of said accumulating means to select different ones time wisely from among said plurality of frequency informations, and means for converting said musical tone waveform read out from said waveform memory device into a musical tone.

4,183,276

PEDAL TEACHING AID FOR AN ELECTRONIC MUSICAL INSTRUMENT

Angelo A. Bione, Chicago, and Donald R. Sauvey, Palatine, both of Ill., assignors to Marmon Company, Chicago, Ill.

Filed Jun. 8, 1977, Ser. No. 804,809
Int. Cl.[2] G10F *1/00;* **G09B** *15/00, 15/08*
U.S. Cl. 84—1.03 **10 Claims**



1. An electronic organ having a keyboard, a pedal clavier, a generator responsive to said keyboard for providing data representative of a bass note routine and a pedal indicator system positioned in proximity to said pedal clavier and comprising:

a converter responsive to said bass note routine data for providing a plurality of binary output signals;

a decoder circuit responsive to said binary output signals and having a plurality of decoder output lines and comprising:

an individual decoder circuit responsive to the two least significant bits of said binary output signals and having a plurality of individual decoder output lines; and

said individual decoder providing a signal on one of said plurality of decoder output lines representative of the binary value of said two least significant bits of said binary output signals;

at least one group decoder circuit responsive to the remainder of said binary output signals and having a plurality of group decoder output lines;

said group decoder circuit providing a signal on one of said plurality of group decoder output lines representative of the binary value of the remainder of said binary output signals;

light means comprising a plurality of banks of light sources and each of said banks having a plurality of light sources and said light means being connected to said decoder output lines;

each of said individual decoder output lines from said individual decoder are connected in circuit to one of said light sources in each of said banks; and

each of said group output lines from said group decoder are connected in circuit to all of said light sources in respective ones of said banks;

said bass note routine data contains octavely related information corresponding to a number of keys on said keyboard;

said decoder circuit rhythmically providing an output signal on selected ones of said output lines to uniquely drive respective ones of said plurality of light sources in unison with said bass note routine; and

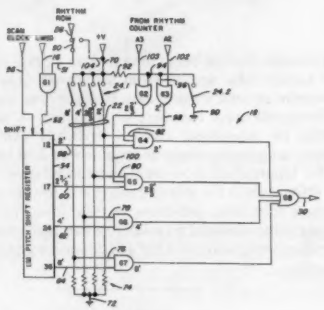
an octave limiter means connected in circuit to at least some of said group decoder output lines for folding back octavely related data exceeding the octave capacity of said light means into a lower octave range.

4,183,277

RHYTHM ACCENT CIRCUIT

Alberto H. Kniepkamp, Arlington Heights, and William Wangard, Melrose Park, both of Ill., assignors to Norlin Industries, Inc., Lincolnwood, Ill.

Filed Aug. 12, 1977, Ser. No. 824,089
Int. Cl.[2] G10H *1/00, 5/00*
U.S. Cl. 84—1.03 **9 Claims**



1. In an electronic musical instrument having means for cyclically generating one or more serial data pulses, the position of each pulse in a serial data cycle being indicative of a particular tone pitch, means for generating an instruction signal comprising a predetermined pattern of beat signals, the duration of each of said beat signals being at least equal to one serial data cycle, and a plurality of tone signal means, each responsive to a predetermined serial data pulse for generating a musical tone having a selected pitch, the improvement comprising

means operative in response to said beat signals for converting each serial data pulse into a plurality of serial pulses; and

means, including manually operable controls, for selectively applying said plurality of serial pulses to cause outputs from corresponding ones of said tone signal means, whereby

a selected plurality of tone signals are generated in response to each of said beat signals.

4,183,278

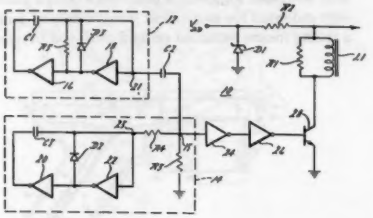
DRIVER CIRCUIT FOR TONE GENERATOR

Irvin B. Rea, Royal Oak, and Michael Slavin, Troy, both of Mich., assignors to Lectron Products, Inc., Troy, Mich.

Continuation of Ser. No. 842,580, Oct. 17, 1977, abandoned.
This application Jan. 22, 1979, Ser. No. 5,394
Int. Cl.[2] G08B *3/10;* **G10H** *5/10*
U.S. Cl. 84—1.24 **17 Claims**

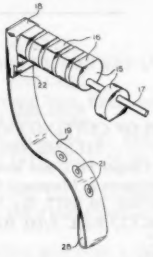
1. A driver circuit for a noise generator that is adapted to cause said noise generator to produce a chime type of audio output comprising:

first oscillator means for producing a relatively high frequency signal having a decaying amplitude characteristic;
second oscillator means for producing a relatively low frequency signal having a decaying amplitude characteristic;
summing means for combining said high and low frequency signals;
modulating means connected to said summing means for producing a pulse width modulated substantially square wave signal from said combined signal at a frequency related to the frequency of said high frequency signal and having a duty cycle that varies in accordance with the amplitude of said low frequency signal; and
driver means connected to said noise generator for driving said noise generator in accordance with said modulated signal.



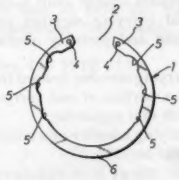
10. A driver circuit for a tone generator that is adapted to cause said tone generator to produce a chime type audio output, including:
first circuit means for producing a relatively high frequency signal having a decaying amplitude characteristic;
second circuit means for causing said relatively high frequency signal to vary according to a relatively low frequency pattern having a decaying amplitude characteristic; and
third circuit means for producing a pulse width modulated substantially square wave drive signal at a frequency related to said relatively high frequency signal and having a duty cycle that varies in accordance with the amplitude characteristic of said relatively low frequency pattern.

4,183,279
VARIABLE CHORD-FORMING CAPO
Lyle F. Shabram, Jr., 1215 Surf Ave., Pacific Grove, Calif. 93950
Filed Jun. 22, 1978, Ser. No. 917,932
Int. Cl.[2] G10D *3/04*
U.S. Cl. 84—318 **5 Claims**



1. An open-ended variable chord-forming capo for use in tuning, and playing note combinations, chord progressions and chord inversions on stringed musical instruments which comprises in combination:
(a) a resilient strap comprising:
(1) a finger loop,
(2) a terminal eyelet,
(3) a plurality of tension adjusting eyelets;
(b) a side support member comprising:
(1) a notched corner, and having
(2) a pin receiving hole;
(c) a pin comprising:
(1) a head,
(2) a knurled area adjacent to the head;
(3) a stem of uniform cross-sectioned diameter;
(d) a plurality of identical elastic finger responsive elastic clamping discs each having:
(1) identical peripheral flattened surfaces,
(2) identical non-centric pin receiving holes, wherein the diameter distance from the holes to the flattened surfaces is longer than the diameter distances from the holes to the curved surfaces;
(e) with the elements and parts of the combination being interrelated as follows:
(1) the resilient strap is rotatably connected to the unnotched side of the side-support member by the head of the pin; also, the resilient strap is connected at its terminal eyelet by the head of the pin, also, the resilient strap is indirectly connected to the clamping discs by the stationary stem of the pin that connects with the side-support member by the knurled area on the pin;
(2) the side-support member indirectly connects the clamping discs by means of the stationary pin through the side-support member's pin receiving hole;
(3) the pin is directly connected to the clamping discs by passing through the clamping disc's non-centric pin receiving holes.

4,183,280
C-SHAPED RETAINING RING
Seiichi Hashimoto, Osaka, Japan, assignor to Taiyo Hatsujo Mfg. Co., Ltd., Osaka, Japan
Filed Mar. 7, 1978, Ser. No. 884,199
Claims priority, application Japan, Dec. 1, 1977, 52-145456
Int. Cl.[2] F16B *21/00*
U.S. Cl. 85—8.8 **4 Claims**



1. A C-shaped retaining ring comprising:
an open portion and at least two pairs of cutouts formed in the inner peripheral edge of the ring and arranged symmetrically on the opposite sides of the open portion;
said ring being uniform in its width and thickness circumferentially thereof and including a portion opposite said open portion without cutouts;
said cutouts being of a semicircular arcuate shape, having the same radius, and being arranged at selective apexes of an equilateral polygon extending around the entire periphery of said ring and formed when the ring is loaded as installed on a shaft;
said cutouts being separately spaced an equal distance apart along the peripheral edge and having a progressively increasing depth toward the open portion, the remaining width of the portion of the ring defining each of the cutouts satisfying the equation:

$$bn = b\left(\frac{\cos\psi_n + \cos\alpha}{1 + \cos\alpha}\right)^{\frac{1}{2}}$$

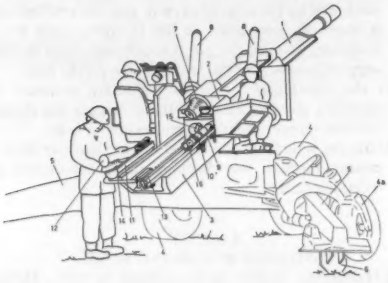
where b_n is the remaining width, b is the width of the ring, α is the angle between the center line and the end face of the open portion, and Ψ is the angle between the center line and the cutout.

4,183,281

METHOD OF AND DEVICE FOR LOADING A FIREARM

K. Sten R. Hultgren, and J. P. Göran Sundmar, both of Karlskoga, Sweden, assignors to Aktiebolaget Bofors, Bofors, Sweden

Continuation of Ser. No. 778,200, Mar. 16, 1977, abandoned. This application Oct. 26, 1978, Ser. No. 955,055
Claims priority, application Sweden, Mar. 31, 1976, 7603851
Int. Cl.[2] F41F *9/06*
U.S. Cl. 89—47 **15 Claims**



1. A method for rapidly loading a projectile and propellant charge within a firearm barrel, comprising the following steps:
loading a projectile onto a loading tray and swinging said loading tray into loading position directly behind said firearm barrel;
loading a propellant charge onto a carrying member and swinging said carrying member into loading position directly behind and partially overlapping said loading tray;
moving said carrying member toward the bore of said barrel, and pivoting a portion of said carrying member into engagement with said projectile;
moving said carrying member into a furthest position within the bore of said barrel,
imparting kinetic energy from said carrying member to said projectile allowing said projectile to freely glide within said barrel until contacting a wall thereof;
withdrawing said carrying member and propellant charge mounted thereon toward a rear entrance of said bore;
separating said propellant charge from said carrying member at a pre-selected distance relative to the rear entrance of said bore; and
completely removing said carrying member from said bore.

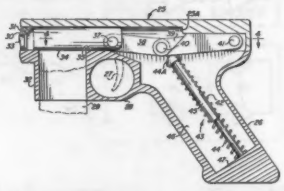
4,183,282

TOGGLE ACTUATING, SHELL LOADING AND EJECTING APPARATUS FOR HAND HELD GUNS

Walter E. Perrine, P.O. Box 621, Elko, Nev. 89801

Filed Sep. 1, 1977, Ser. No. 829,796
Int. Cl.[2] F41D *3/02*
U.S. Cl. 89—189 **7 Claims**

1. A bolt action weapon comprising:
A frame,
a handle on said frame,
a hollow barrel having a firing chamber,
a bolt movable in said frame axially to and from the firing chamber of said barrel,
a toggle connected at one end to said bolt and at the other end to said frame,
said toggle comprising a pair of pivotally connected links, the free end of one of said links being pivotally connected to said bolt and the free end of the other of said links being pivotally connected to said frame, said toggle being movable to a locked position when said bolt has been moved to said firing chamber,
a compression means for controlling the movement of said toggle as it collapses by causing the intermediate pivot axis to swing downwardly away from said bolt, said compression means comprising a push rod pivotally engageable with said toggle at a point between its ends and slidably mounted for movement transversely of said bolt, and a spring means mounted on said push rod between a fixed



flange in said handle and a fixed flange on said push rod for compression of said spring means during movement of said push rod upon collapsing of said toggle, said spring means biasing said toggle to its locked position after a collapsing action of said toggle.
said bolt being cone-shaped at its free end to fit into a corresponding conical shape in the juxtapositioned end of the firing chamber in said barrel,
a breaking lever for biasing said toggle to one of a number of positions,
said lever comprising a spring biased plunger mounted in an opening arranged in said frame coaxially of its longitudinal axis,
a cam arm engageable by said plunger, and
a lever arm extending laterally of said frame for movement of said cam arm by a user into engagement with said toggle for biasing and holding said toggle in one of a number of positions.

4,183,283

METHODS OF CUTTING PATTED HOLLOW FILAMENTS

James C. Danos, Chapel Hill, and Robert J. Heider, Durham, both of N.C., assignors to Monsanto Company, St. Louis, Mo.

Filed Nov. 30, 1977, Ser. No. 855,845
Int. Cl.[2] B23C *3/00;* **B23B** *1/00*
U.S. Cl. 90—11 C **10 Claims**

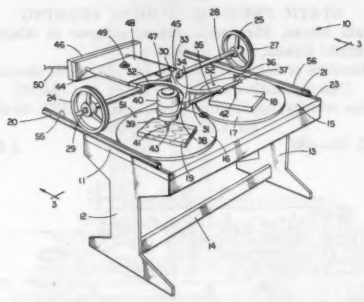
1. A method for removing thin layers from solid potting masses containing hollow filaments for fluid separations to expose the bores of the hollow filaments comprising moving a knife blade edge in an essentially arcuate path to impact the potting mass with the knife blade edge at a sufficient velocity to cause localized fracturing of the potting mass at the point of impact thereby removing the thin layer of the potting mass.

4,183,284

APPARATUS FOR THE THREE-DIMENSIONAL REPRODUCTION OF AN OBJECT

Donald R. Laskowski, 2346 Fisher Ave., Indianapolis, Ind. 46224

Filed Mar. 13, 1978, Ser. No. 886,265
The portion of the term of this patent subsequent to Mar. 14, 1995, has been disclaimed.
Int. Cl.[2] B23C *1/18*
U.S. Cl. 90—13.3 **13 Claims**



1. An apparatus for the three-dimensional reproduction of an object comprising:

a base;

a shaft having a central axis;

means for mounting said shaft to said base to be moveable relative to said base along an axis perpendicular to the central axis of said shaft;

a mounting bracket mounted to said shaft, said mounting bracket being rotatable about the central axis of said shaft and moveable axially along said shaft;

first and second rod portions;

mount means for coaxially mounting said first and second rod portions to be rotatably supported by said mounting bracket, said mount means further being for providing corresponding rotation of the first and second rod portions;

a stylus mounted to the first rod portion;

cutting means mounted to the second rod portion;

a first platform rotatably mounted to said base and positioned to permit an object placed thereon to be contacted by said stylus; and

a second platform rotatably mounted to said base and positioned to permit a work piece placed thereon to be contacted by said cutting means, said first and second platforms being rotatable in parallel planes.

4,183,285

ROTARY CONTROL VALVE FOR EXPANSION FLUID ENGINES

Robert L. Stevenson, Overland Park, Kans., assignor to Havaco Incorporated, Overland Park, Kans.

Filed Jul. 10, 1978, Ser. No. 923,184
Int. Cl.[2] F01L *33/02, 31/20*
U.S. Cl. 91—180 **10 Claims**

1. A rotary control valve for an expansion fluid driven engine having a cylinder and a piston therein; said valve comprising:

(a) a housing having a fluid inlet port, a fluid outlet port, a distribution port positioned at one end of said housing for communicating with said cylinder, and a first sealing face disposed about said distribution port;

(b) a drive shaft extending into said housing and rotatably mounted therein;

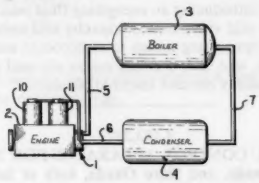
(c) a rotor positioned within said housing and forming a cavity between said rotor and said housing; said rotor being mounted on said drive shaft, and rotating with said drive shaft and translating axially with respect thereto; said rotor having:

(1) a peripheral surface, and a pair of end surfaces;

(2) a pressure passageway alternately communicating said distribution port with said fluid inlet port;

(3) an exhaust passageway spaced apart from said pressure passageway, and alternately communicating said distribution port with said fluid outlet port;

(4) a second sealing face positioned about one end of said pressure passageway and said exhaust passageway, and mating with said first sealing face to form a sliding seal therebetween;



(d) means rotating said drive shaft and said rotor in syncronization with the reciprication of said piston; and

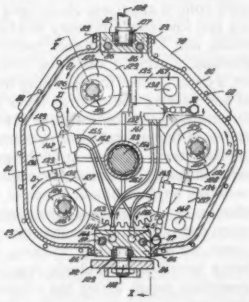
(e) a seal member sealing between the periphery of said rotor and said housing, and dividing said cavity into separate intake and exhaust chambers which respectively communicate with said intake and exhaust ports; said first and second sealing faces being positioned within said exhaust chamber, whereby operational fluid pressure urges said sealing faces abuttingly together with automatically varying compression and forms a secure sliding seal sequentially between said distribution port and said pressure and exhaust passageways.

4,183,286

DRIVING MECHANISMS AND HOUSINGS FOR SUCH MECHANISMS

Cornelis van der Lely, 7 Brüschenrain, Zug, Switzerland

Division of Ser. No. 588,140, Jun. 19, 1975, Pat. No. 4,084,485.
This application Mar. 23, 1978, Ser. No. 889,531
Claims priority, application Netherlands, Jun. 25, 1974, 7408501
Int. Cl.[2] F01B *15/06*
U.S. Cl. 91—215 **12 Claims**



1. A control valve arrangement for a reciprocating motor comprising: support means; first pivot means and second pivot means, each said pivot means connected to said support means whereby said pivot means are spaced apart by a predetermined unchanging distance; a driving mechanism connected to said first pivot means whereby it is adapted to rock in an arc about

said first pivot means; said driving mechanism including reciprocating means comprising a piston and rod connected to said piston; a driven member connected to said reciprocating means whereby upon reciprocation of said reciprocating means said driving mechanism is caused to rock in said arc about said first pivot means; said driven member comprising a shaft, an eccentric member mounted on and surrounding said shaft, a bearing ring surrounding said eccentric member, a further ring surrounding said bearing ring, said rod being rigidly connected to said further ring; control means mounted on said driving mechanism, said control means including valve means connected to said second pivot means whereby when said driving mechanism rocks in said arc, said valve means moves relative to the remainder of said control means and said driving mechanism; and means for introducing an energizing fluid into said driving mechanism by said valve means whereby said energizing fluid causes said reciprocating means to reciprocate and drive said driven member, said reciprocating means and said valve means having substantially parallel longitudinal axes.

4,183,287

HYDRAULIC CONTROL APPARATUS FOR TRACTOR

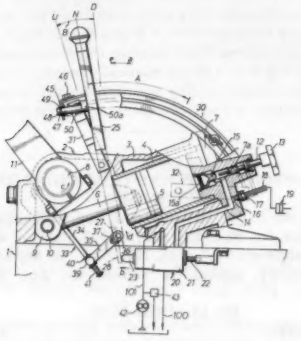
Toshihiko Hamada, and Shiro Okuda, both of Sakai, Japan, assignors to Kubota Tekko Co., Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 620,321, Oct. 7, 1975, abandoned. This application Sep. 27, 1977, Ser. No. 837,038

Claims priority, application Japan, Feb. 22, 1975, 50-22321; Jun. 23, 1975, 50-87717[U]; Jun. 23, 1975, 50-87718[U]

Int. Cl.[2] F15B *9/10, 13/06*

U.S. Cl. 91—384 **3 Claims**



1. A hydraulic control apparatus comprising a first hydraulic unit for raising and lowering a primary working implement, a second hydraulic unit for raising and lowering a secondary working implement, a control valve for controlling the first hydraulic unit, a control lever for operating the control valve, a guide plate for guiding the control lever and a feedback mechanism for returning the control valve to a neutral position for every position of the control lever in operative relation to the upward or downward movement of the primary working implement, the guide plate providing a first operation range for the primary working implement and a second operation range for the secondary working implement, the control lever having a neutral position corresponding to a maximum lift position of the control lever for the primary working implement, the guide plate being provided with elastic regulating means for the second operation range to set the control lever in the neutral position, an oil passage extending from the control valve to the first hydraulic unit and being provided with means for holding the first hydraulic unit filled with oil, the second hydraulic unit being controllable through the control valve by the operation of the control lever within the second operation range while the first hydraulic unit is in a locked state, the control lever being automatically returnable to the neutral position for the secondary working element by the restoring action of the elastic regulating means when operated in a direction against the elastic regulating means.

4,183,288

STATIC PRESSURE THRUST BEARING

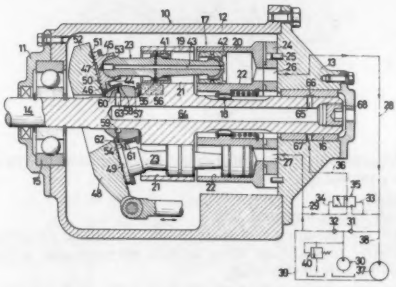
Takayuki Miyao, Hiratsuka, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Aichi, Japan

Continuation of Ser. No. 586,610, Jun. 13, 1975, abandoned. This application Jan. 3, 1977, Ser. No. 756,390

Claims priority, application Japan, Jun. 13, 1974, 49-67450

Int. Cl.[2] F01B *13/06*

U.S. Cl. 91—488 **3 Claims**



1. A static pressure thrust bearing, comprising:

means for supplying lubricating oil containing particulates;

a first annular member having a flat sliding surface;

a second member, having an orifice connected to said supply means, comprising an axial thrust means, including a central static pressure pocket and a peripheral land surface disposed about said pocket for sealing said static pressure within said pocket, and being slidable upon said flat sliding surface; and

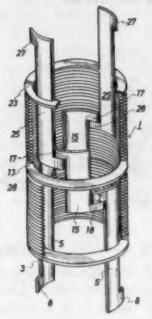
a plurality of recesses, formed within, and distributed throughout, both said annular flat sliding surface of said first member and said peripheral land surface of said second member in a random manner, for receiving particulates mixed within lubricating oil during the operation of said bearing, each of said recesses formed within and distributed thoughout said annular flat sliding surface being circular in cross-section taken along a plane parallel to said annular flat sliding surface, said diametrical extent of said recesses gradually decreasing in the direction extending away from said surface, and the number of said recesses within both said first and second members being sufficiently large so as to densly pack said recesses within the surfaces of said members and thereby provide a continuous fluidic interchange process of said lubricating oil between said peripheral land area of said second member also being physically separated from said central pocket so as to establish a pressure differential therebetween, such that the static pressure difference between said central pocket and said peripheral land area and the cooperation of said recesses causes said particulates to move radially from said central pocket to said peripheral land area and from said recesses of said peripheral land area to said recesses of said flat sliding surface by simultaneous radial communication of said recesses during operation of said thrust bearing.

4,183,289

BELLOWS APPARATUS

Takeshi Jinnouchi, Sakado, Japan, assignor to Nippon Oil Seal Industry Co., Ltd., Japan

Filed Sep. 19, 1977, Ser. No. 834,445
Claims priority, application Japan, Sep. 22, 1976, 51-128026
Int. Cl.[2] F16J 3/04
U.S. Cl. 92—43 **2 Claims**



1. A bellows apparatus consisting essentially of a bellows main body and restriction means for restricting elongation and contraction, said restriction means comprising

a plurality of annular, first, second and third guide metals arranged integrally with said bellows main body with a predetermined spacing therebetween in the axial direction;

a plurality of first, second and third guide members, each secured integrally to each of said first, second and third guide metals and each extending in the axial direction and projecting on opposite sides of a respective guide metal and terminating in edge sections; and

a plurality of first, second and third stoppers each integrally extending in the circumferential direction from the edge section of each of said first, second and third guide members;

said first, second and third guide members being disposed such that they do not overlap each other in the circumferential direction and restricting the elongation and contraction of said bellows main body in cooperation with said first, second and third stoppers and said first guide member being abutted by said third guide metal and said third guide member being abutted by said first guide metal, when said bellows main body is contracted.

4,183,290

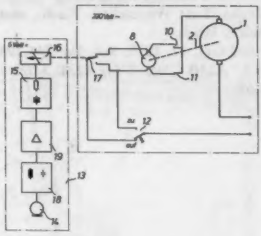
AIR VENT

Eckhard Kucharczyk, Netphen, Fed. Rep. of Germany, assignor to Siegenia-Frank Kg., Siegen, Fed. Rep. of Germany

Filed Apr. 17, 1978, Ser. No. 897,154
Claims priority, application Fed. Rep. of Germany, Jan. 31, 1978, 2719144
Int. Cl.[2] E04B 1/99
U.S. Cl. 98—37 **12 Claims**

1. Air vent for rooms where its air vent openings respectively ducts can selectively be opened or closed by electrical drives,

characterized by the fact that a sound sensor (**14**) such as a microphone and a time-switch relay (**15**) activated by the microphone contained within a switch arrangement which, on open vent openings, puts the drive (**1**), not presently under current, during sound increase, immediately into the electrical circuit, first for the closure of the



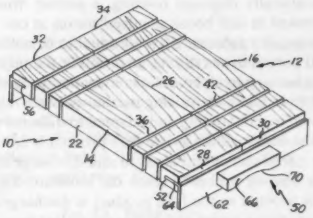
openings and thereafter with delayed action for the opening of the vent openings.

4,183,291

HICKORY WOOD COOKING PLANK

Homer F. Portman, 1057 Hillsboro Mile, Pompano Beach, Fla. 33062

Filed Mar. 11, 1977, Ser. No. 776,929
Int. Cl.[2] A47J 37/01, 37/04
U.S. Cl. 99—425 **9 Claims**



1. An oven cooking utensil, which comprises:

a cooking plank made of hickory wood and having a substantially planar upper cooking surface upon which the food to be cooked is placed, a lower surface and a pair of substantially parallel, vertical planar side surfaces extending perpendicularly from opposite sides of said upper cooking surface to said lower surface;

means for supporting said cooking plank in a raised relationship to the oven surface and said means for supporting also providing means for dissipating heat from said cooking plank; and

a pair of substantially planar support grooves formed along substantially the entire length of and extending inwardly from said pair of parallel vertical side surfaces of said plank and being substantially parallel to said upper cooking surface for frictionally receiving and securing said support means and said heat dissipating means;

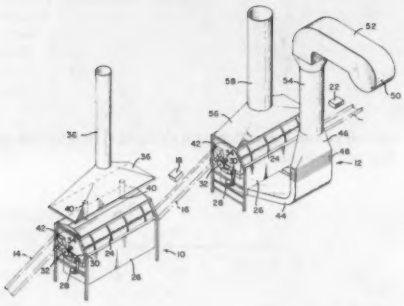
said heat dissipating means and said supporting means comprising a pair of L-shaped aluminum support elements each comprising a planar elongated flange adapted to be received within one of said pair of support grooves and a planar elongated leg which integrally extends from said flange.

4,183,292

CONTINUOUS FLOW SYSTEM FOR EQUALIZING THE MOISTURE CONTENT OF MOISTURE ABSORBING FRUIT PRODUCTS

Kenneth A. Banks, East Wenatchee, Wash., assignor to Tree Top, Inc., Selah, Wash.

Filed Oct. 12, 1977, Ser. No. 841,298
Int. Cl.[2] A23B 7/06, 7/14; A23L 3/18, 3/34
U.S. Cl. 99—468 5 Claims



1. A system for equalizing the moisture content of fruit products, comprising:

a moisturizing means for increasing the moisture content of said fruit product above a predetermined target value, said moisturizing means comprising an elongated, generally horizontally disposed housing, a porous drum rotatably disposed in said housing, infeed means at one end of said housing for delivering fruit product to be moisturized into said porous drum, discharge means at the opposite end of said housing to receive and convey moisturized fruit product from said moisturizing means, moisture injectors positioned in said housing and adapted to disburse moisture on to the fruit product as the fruit product is conveyed from the infeed end of said drum to said discharge means, moisture sensing means to sense the moisture content of the fruit product as the fruit product is discharged from said moisturizing means and means controlled by said moisture sensing means to alter the moisture disbursed by the moisture injectors to achieve the predetermined moisture value;

drier means for reducing the moisture content of the fruit product to said predetermined target value, said drier means comprising an elongated, generally horizontally disposed drier housing, a porous drum rotatably positioned in said drier housing, drum rotating means interconnected to said drum for rotating said drum, a hot air inlet and an exhaust port interconnected to said drier housing, means forcing hot air into said housing and suction means for extracting air and gases from said drier housing and venting said air and gases to atmosphere and discharge means at the end of the drum opposite said conveying means;

conveying means positioned between said moisturizing means and said drier means to move the moisturized fruit product to the drier means;

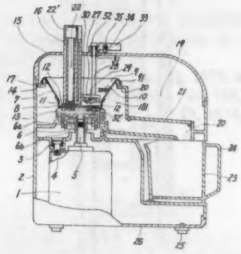
moisture sensing means adjacent said discharge means to sense the moisture in the fruit product and means controlled by said moisture sensing means to alter the temperature of the air introduced into said drier means whereby the fruit product produced has a moisture content approximating the predetermined target value.

4,183,293

JUICE EXTRACTOR

Yuzuru Arao, Takatsuki; Katsufumi Nishio, Toyonaka; Masashi Mikami, Osaka, and Toyoaki Murasawa, Nishinomiya, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Nov. 21, 1977, Ser. No. 853,831
Claims priority, application Japan, Dec. 22, 1976, 51-155359
Int. Cl.[2] A23N 1/02
U.S. Cl. 99—512 11 Claims



1. In a juice extractor, comprising:

a centrifugal basket having as a filter an upwardly diverging frusto-conical peripheral wall having a plurality of juice-passing filtering perforations therethrough;

an underlying pot part connected to the lower, smaller base of said frusto-conical peripheral wall, said pot part having a bottom wall with a generally flat upwardly facing inner face, and a generally vertically upstanding outer peripheral wall,

means defining a plurality of cutting teeth on said pot part inner face;

conduit means defining a food feeding duct situated substantially vertical to and overlying said bottom wall;

motor means operatively connected to said basket for rotating said basket and said pot part at high speed about a generally vertical axis in a certain direction,

the improvement comprising:

a plurality of pulp-passing perforations provided through said outer peripheral wall of said pot part,

said pulp-passing perforations collectively being fewer in number but averaging larger in individual size than said juice-passing filtering perforations;

a scraper adjustably disposed within said pot part, said scraper having a forward face having an upper part, a lower part and a radially outer tip; and

a selecting means connected with said scraper for adjusting the disposition of said scraper and said selecting means being movable between a first position and a second position, of which:

when said selecting means is in said first position said scraper forward face outer tip is disposed so close to said pot part outer peripheral wall as to be urgeable into scraping relation therewith upon said pulp-passing perforations when said scraper forward face is contacted by lumps of juice-bearing food pulp during high speed rotation of said basket and pot part, and

when said selecting means is in said second position said scraper forward face outer tip is disposed more distally of and so far from said pot part outer peripheral wall as to not be urgeable into scraping relation therewith upon said pulp-passing perforations when said scraper forward face is contacted by lumps of juice-bearing food pulp during high speed rotation of said basket and pot part;

said forward face of said scraper, when said selecting means is in said first position, being of downward tilted disposition so that said upper part thereof is disposed further

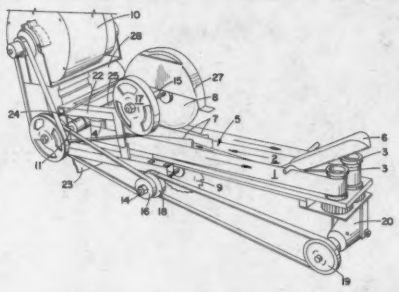
upstream than said lower part thereof will respect to said direction of rotation of said basket, so that at least some of the juice-bearing food pulp which has descended through said food feeding duct and which has been flung radially outwards by rotation upon said pot part upwardly facing inner face, to impact said pot part upstanding outer peripheral wall and is tending to move upwards along said pot part upstanding outer peripheral wall by succeeding quanta of said juice-bearing food pulp, is scraped off of said outer peripheral wall and downwards onto said pot part upwardly facing inner face, in effect being thereby recycled for further cutting and centrifugal impacting, and so that at least some of the juice-bearing pulp which has impacted said pot part upstanding outer peripheral wall and has protruded partially radially outwardly through said pulp-passing perforations, is sheared off by scraping engagement of said scraper front face outer tip with said pot part outer peripheral wall upon said pulp-passing perforations.

4,183,294

STONE FRUIT CUTTER

James A. Williams, deceased, late of Waikerie, Australia (by Annie M. Williams, trustee), and Colin J. Williams, Waikerie, Australia, assignors to J.A. & A.M. Williams Pty. Ltd.

Filed Feb. 2, 1978, Ser. No. 874,861
Int. Cl.[2] A23N *4/04, 4/22*
U.S. Cl. 99—537 **10 Claims**



1. A stone fruit cutter including a pair of horizontally spaced substantially vertical belts, a stationary surface below said belt to define a channel open at the top and bottom to guide and carry the fruit therealong, a pair of vertical disc cutters displaced one above the other to provide an upper and lower cutter, so that during cutting the fruit is supported by the belts to convey the fruit between and pass said cutters and also rotate said fruit to produce a cut around its circumference to the depth of the stone, said fruit being fed into said channel by a chute which extends between and separates said belts at the inlet end to form said channel whereby fruit passing down said chute is fed into said channel.

4,183,295

TRASH COMPACTOR WITH COVER MOUNTED PACKING BLADE

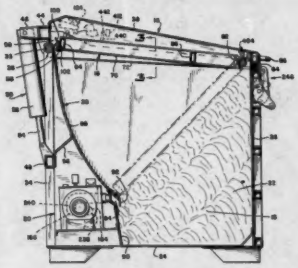
Robert A. Peterson, 16521 Redwood Dr., Cerritos, Calif. 90701

Filed Mar. 20, 1978, Ser. No. 890,720
Int. Cl.[2] B30B *1/08, 15/06*
U.S. Cl. 100—53 **37 Claims**

1. In a refuse compactor, the combination comprising:

a refuse container including a container body having relatively rigid side and bottom walls defining a refuse receiving space within the body, and further defining a top access opening to said refuse space, and a hinged cover swingable to and from closed position on top of said side walls to cover said top opening, and

a refuse packing blade hinged to swing downwardly relative to said cover to an extended position within said refuse space when said cover is closed to compress refuse between said blade and a container body wall and to swing upwardly from said refuse space to a retracted position



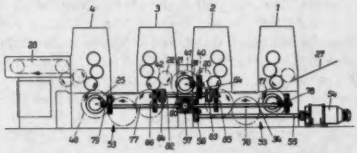
adjacent said cover, wherein said cover may be opened with concurrent lifting of said blade out of registration with said opening, said blade having a plan form and area to fully obturate said opening and said refuse space.

4,183,296

DRIVE SYSTEM FOR SHEET-FED ROTARY PRINTING PRESSES WITH TANDEM-MOUNTED PRINTING UNITS

Hugo Rambausek, Wiesloch, Fed. Rep. of Germany, assignor to Heidelberger Druckmaschinen Aktiengesellschaft, Heidelberg, Fed. Rep. of Germany

Continuation of Ser. No. 485,716, Jul. 3, 1974, abandoned. This application Feb. 9, 1976, Ser. No. 656,276
Claims priority, application Fed. Rep. of Germany, Jul. 5, 1973, 2334177
Int. Cl.[2] B41F *5/06*
U.S. Cl. 101—181 **6 Claims**



1. In a sheet-fed rotary printing press with tandem-mounted printing units that are driven by a common motor through a main drive shaft and a closed gear train, at least two power input locations being provided in the gear train so as to form a closed power circuit, a drive system comprising at least one secondary power circuit formed in the first-mentioned power circuit and connected in parallel with at least part of the gear train, said secondary power circuit having transmission means and a slip clutch connected serially therein, said slip clutch having a variable torque transmission increasing with the square of the difference between the input and output rotary speeds thereof.

4,183,297
ROTARY ASSEMBLY FOR TWO-SIDED OFFSET PRINTING

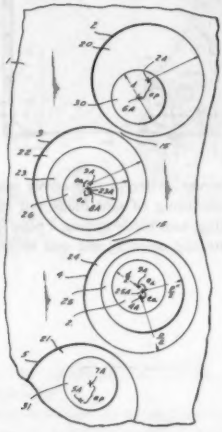
Heinz Skiera, Leipzig, German Democratic Rep., assignor to VEB Polygraph Leipzig Kombinat für Polygraphische Maschinen und Ausrüstungen, Leipzig, German Democratic Rep.

Filed May 6, 1977, Ser. No. 794,567

Claims priority, application German Democratic Rep., May 13, 1976, 192823

Int. Cl.[2] B41F *7/02*

U.S. Cl. 101—218 **12 Claims**



1. A printing assembly comprising a plurality of cylinders each having a mounting portion; a support; and means for adjacently mounting said cylinders on said support, including means bounding a plurality of adjacent cylindrical holes in said support which includes a web between and separating the adjacent holes, and a plurality of eccentrics each turnably received in one of said holes and eccentrically accommodating said mounting portion of one of said cylinders, each of said holes having a diameter exceeding that of the associated cylinder to permit the latter to pass therethrough for assembly with and disassembly from said support.

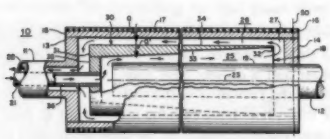
4,183,298
WATER COOLED INK ROLLER FOR PRINTING PRESSES

Bert Cappel, Lammerspiel; Peter Mayer, Muhlheim; Burkhardt Wirz, and Peter Decker, both of Munich, all of Fed. Rep. of Germany, assignors to Roland Offsetmaschinenfabrik Faber & Schleicher AG and Grapho Metronic Mess-und Regeltechnik GmbH & Co., both of, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 863,734, Dec. 23, 1977, abandoned. This application Feb. 17, 1978, Ser. No. 878,735

Int. Cl.[2] B41F *31/26*; F28D *11/02*; F28F *5/02*; B21B *27/06*

U.S. Cl. 101—348 **7 Claims**



1. An ink roller for a printing press comprising, in combination, a shaft, a cylindrical outer shell secured to the shaft and presenting an outer roller surface, a central fluid-displacing core, a hollow cylindrical partition interposed between the shell and the core defining concentric inner and outer annular passageways connected in series with one another, means defining an inlet opening in the shaft connected to one end of the inner passageway, means defining an outlet opening in the shaft connected to the corresponding end of the outer passageway, a source of cooling fluid connected to the inlet opening so that a feed stream of cooling fluid moves longitudinally through the inner passageway and turns around to form a cooling stream flowing in counterflow relation through the outer passageway, the cylindrical partition being formed of conductive material so that heat absorbed from a given region of the roller surface by the cooling stream flows radially inward through the partition for absorption by the feed stream thereby to tend to equalize the temperature along the length of the cooling stream and hence along the length of the outer roller surface.

4,183,299
DEVICE FOR FITTING A BLANKET ON THE CYLINDER OF A PRINTING PRESS

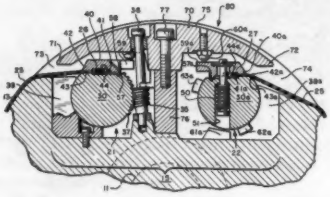
Bert Cappel, Muhlheim am Main, Fed. Rep. of Germany, assignor to Roland Offsetmaschinenfabrik, Fed. Rep. of Germany

Filed Feb. 23, 1978, Ser. No. 880,571

Claims priority, application Fed. Rep. of Germany, Feb. 23, 1977, 2707643

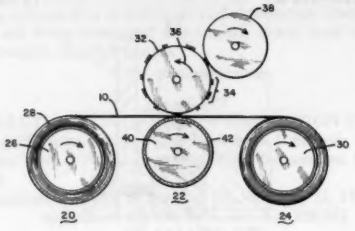
Int. Cl.[2] B41F *27/12*

U.S. Cl. 101—415.1 **6 Claims**



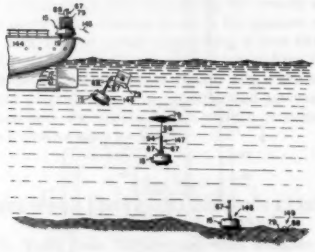
1. A blanket cylinder for an offset printing press employing a resilient blanket having a reinforcing bar extending along its end edge comprising, in combination, a cylinder body having a longitudinal groove defining a gap in the cylinder surface, a shaft in the groove journaled for rocking movement from a reference position to a blanket tightening position, manual means for rockingly positioning the shaft, a jaw member having a central hinge defining a jaw on one side, a co-operating jaw seat on said shaft and an actuating arm on the other side, the hinge extending longitudinally at the surface of the shaft so that the jaw member is rockable with respect to jaw seat between an open position and a closed position, the jaw in its open position creating an entryway facing chordwise of the cylinder with the shaft in its reference position, the jaw having an inner recess extending longitudinally of the shaft and which is accessible through the entryway only when the jaw is in open position for receiving the reinforcing bar on the blanket, a biasing spring carried by the shaft for biasing the jaw into closed position, a stop supported on the cylinder in the path of movement of the actuating arm so positioned that (a) the actuating arm is engaged to open the jaw against the force of bias when the shaft is in its reference position enabling the reinforcing bar on the blanket to be inserted into the recess and that (b) manual rotation of the shaft from its reference position moves the actuating arm away from the stop for closure of the jaw by the spring to capture the bar in the recess and for thereafter swinging the bar to tighten the blanket.

4,183,300
METHOD OF IMPRINTING CHARACTERS ON ADHESIVE BEARING TAPES
Khosrow Jamshidi, 610 Winston Ct., St. Paul, Minn. 55118
Filed Jan. 31, 1978, Ser. No. 873,794
Int. Cl.[2] B41J *3/24;* B44B *7/00*
U.S. Cl. 101—426 5 Claims



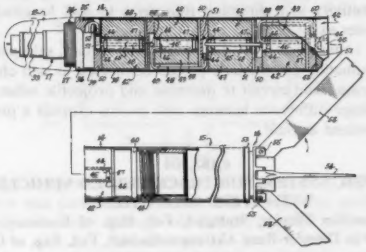
1. A method of printing characters on an ink-absorbing medium having a pressure sensitive adhesive on one surface thereof and an antiblocking coating nonreceptive to ink on the opposite surface thereof, comprising the steps of:
(a) providing a printing plate having a pattern of pin-like projections extending from a surface thereof defining characters to be printed;
(b) coating said pattern with an ink; and
(c) bringing said coated pattern into contact with said opposite surface of said medium with sufficient force such that said pin-like projections penetrate through said antiblocking coating to deposit ink on said medium.

4,183,301
INDUCTION GROUND MINE AND FIRING MECHANISM THEREFOR
Richard J. Burke, Babbitt, Nev., and George Renholt, Jr., Washington, D.C., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.
Filed Aug. 7, 1944, Ser. No. 548,484
Int. Cl.[2] F42B *22/00, 22/04*
U.S. Cl. 102—13 26 Claims



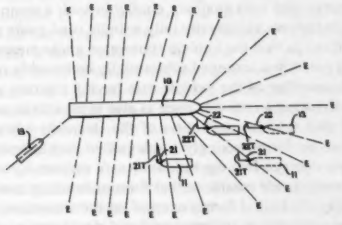
1. In a mine of the character disclosed adapted to be planted on the bed of a body of water from a surface vessel, the combination of a mine casing, a drag plate for the mine adapted to retard the downward movement thereof as the mine descends through the water, means including a line for detachably securing the drag plate to the casing in such a manner as to cause the casing to be righted during the descent of the mine through the water, and means effective when the mine reaches a predetermined depth of submergence for disconnecting the drag plate from the casing.

4,183,302
SEQUENTIAL BURST SYSTEM
George H. Schillreff, Glendora, Calif., assignor to General Dynamics Pomona Division, Pomona, Calif.
Filed Nov. 6, 1967, Ser. No. 680,712
Int. Cl.[2] F42B *13/42*
U.S. Cl. 102—89 CD 10 Claims



1. In a decoy round containing at least a nose cone section, a payload section, and a propulsion section, a sequential burst system comprising: a timing mechanism, at least two time delay assembly means positioned in different predetermined portions of said payload section, means within each of said predetermined payload section portions for dispersing said portions, fuse means interconnecting said time delay assembly means and extending adjacent an external surface of said payload section portions for splitting the skin thereof upon activation of said fuse means and for activating the next of said time delay assembly means, and means operatively connected with said timing mechanism for activating a first of said time delay assembly means, whereby after a predetermined condition of flight of said round the timing mechanism initiates said sequential burst system by activating said time delay activating means which initiates operation of said first of said time delay assembly means which in turn activates a first of said payload section portion dispersing means and a first of said interconnecting fuse means thereby dispersing said first payload section portion while substantially simultaneously splitting the skin of said payload section portion and activating the next time delay assembly means which similarly causes the next payload section portion to be dispersed and so on throughout the payload section.

4,183,303
PROXIMITY FUZE
Philip Krupen, Silver Spring, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.
Filed Feb. 25, 1963, Ser. No. 275,779
Int. Cl.[2] F42C *13/00*
U.S. Cl. 102—211 3 Claims



1. A voltage-gradient sensitive proximity fuze for use with a rotating projectile against electrostatically charged targets and which will detonate the projectile at an optimum distance from the target comprising:

(a) a pair of conducting electrostatic probes, said electrostatic probes being arranged symmetrically with respect to a plane of symmetry containing the longitudinal center axis of the projectile, said probes being of such limited circumferential extent that a voltage-gradient is developed between said probes when the longitudinal center axis of the projectile is at an angle to an external electrostatic field, whereby the fuze will have a high voltage-gradient sensitivity in a direction transverse to said longitudinal center axis;

(b) a voltage sensitive electronic firing circuit, said pair of conducting electrostatic probes connected to said circuit to cause said circuit to detonate said projectile when the voltage difference between said probes exceeds a predetermined amount.

4,183,304

TRAFFIC SYSTEM FOR TRACK-GUIDED VEHICLES WITH STEERABLE WHEELS

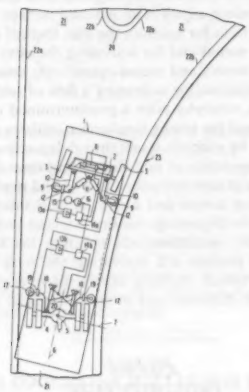
Hans-Joachim Förster, Stuttgart, Fed. Rep. of Germany, assignor to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany

Filed May 3, 1978, Ser. No. 902,496

Claims priority, application Fed. Rep. of Germany, May 11, 1977, 2721071

Int. Cl.² B61F 9/00

U.S. Cl. 104—247 **11 Claims**



1. A traffic system, comprising on the side of the road at least one road guide means operable to be mechanically detected and predetermining the track, and on the vehicle side at least one transverse guide means following the road guide means, the interactions between road guide means and the transverse guide means being operable to be transmitted to steerable wheels under interconnection of a force and movement transmission means fed with auxiliary energy in such a manner that the vehicle follows unilaterally only a single road guide means, characterized in that the vehicle transverse guide means in its operating position is arranged substantially immovably relative to an axle member of the vehicle axle having steering wheels and is constructed so sturdily itself as also as regards its suspension that also without deflection of the steerable wheels the vehicle can be form-lockingly track-guided and laterally displaced in a damage-free operationally safe manner by way of the transverse guide means, in that force-measuring means for determining the lateral forces exerted on the transverse guide means are arranged in the suspension of the transverse guide means, and in that the force and movement transmission means are so constructed that the steerable wheels are always automatically deflected so as to maintain a predetermined desired value of the lateral force at the transverse guide means.

4,183,305

FURNACE SEAL

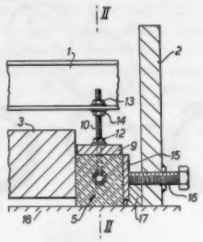
Geoffrey Payne, Rotherham, England, assignor to British Steel Corporation, London, England

Filed Feb. 27, 1978, Ser. No. 881,405

Claims priority, application United Kingdom, Mar. 8, 1977, 9670/77

Int. Cl.² F23M 7/00

U.S. Cl. 110—173 A **11 Claims**



1. A demountable peripheral seal for sealing an opening between a furnace closure member and a mating furnace wall face, comprising an elongate rectangular-section assembly of ceramic fibre arranged in layers lying in generally parallel planes perpendicular to the length thereof mountable on the closure member and having a flat face arranged to bear on a mating face of the furnace wall when the seal assembly is mounted on a closure member, and means enabling advancement of the assembly perpendicular to its length, whereby the flat face thereof can be maintained in contact with the wall face whereby to compensate for wear and erosion of the fibre assembly.

4,183,306

HOT GAS RECIRCULATION TYPE BURNING FURNACE

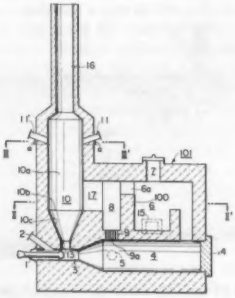
Toshikatsu Haga; Saburo Hori, and Yukio Ito, all of Iwaki, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 4, 1977, Ser. No. 839,345

Claims priority, application Japan, Oct. 8, 1976, 51/120304

Int. Cl.² F23G 7/06

U.S. Cl. 110—204 **7 Claims**



1. A burning furnace comprising a cyclone for receiving exhaust gases, one or more secondary air-introducing nozzles attached to said cyclone at a top portion thereof or in close proximity to said top portion for forming a downwardly directing swirling air flow within the interior of said cyclone, said exhaust gases being introduced into an evacuated core of said swirling air flow for centrifugal separation of heavier dust particles from said exhaust gases, a portion of said exhaust

gases being separated from the other exhaust gases and being mixed with the secondary air, the mixture of said secondary air with said separated exhaust gas portion being returned to a beginning portion of the furnace for recirculation, an ejector having a suction inlet provided at the lower end of said cyclone, a hot gas recirculation chamber having an inlet connected with an outlet of said ejector, and a combustion chamber system connected fluidically with the downstream end of said recirculation chamber, said hot gas recirculation chamber being separated by a wall from said combustion chamber system and being positioned at a slightly lower level than said combustion chamber system.

4,183,307

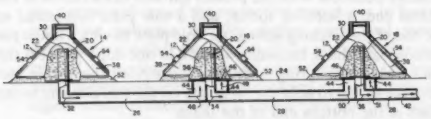
POLLUTION CONTROLLED INCINERATION SYSTEM

Albert W. Spitz, Elkins Park, and Milton I. Schwab, Philadelphia, both of Pa., assignors to Milpat Corporation, Glenside, Pa.

Continuation-in-part of Ser. No. 806,831, Jun. 15, 1977. This application Jul. 26, 1978, Ser. No. 928,142

Int. Cl.[2] F23G *7/00*

U.S. Cl. 110—235 **10 Claims**



1. In an incineration system suitable to remove insulation from wire, the combination of

a plurality of combustion stations arranged in series relationship upstream from a pollution control apparatus, comprising at least one remote station and one proximate station,

said remote and proximate stations including an inlet opening adapted to remove gaseous products of combustion from the respective said stations,

said proximate station additionally comprising an exhaust opening adapted to receive gaseous products from the remote station, and

said remote and proximate stations comprising a primary combustion chamber means adapted to overfit each inlet opening and a pile of insulation covered wire to permit the breakdown of the insulation within the space defined by the primary combustion chamber means into carbon and gaseous products of combustion; and

a duct system means interconnecting the remote and proximate combustion stations to carry the gaseous products, said duct system means comprising a first branch duct adapted to lead in the gaseous products from the remote station to the proximate station and a second branch duct adapted to convey concentrated gaseous products from both the remote station and the proximate station to a downstream location.

4,183,308

FLUIDIZED BED UNIT INCLUDING AN ELECTRICAL AIR PREHEAT APPARATUS

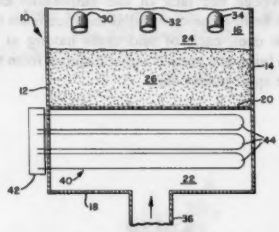
Dennis A. Toth, Lake Hopatcong, N.J., assignor to Foster Wheeler Development Corporation, Livingston, N.J.

Filed Mar. 8, 1978, Ser. No. 884,517

Int. Cl.[2] F23D *19/02*

U.S. Cl. 110—263 **2 Claims**

1. A fluidized bed unit comprising a housing, grate means disposed in said housing and dividing said housing into an upper chamber and a lower chamber, a bed of particulate material including fuel supported by said grate means and extending in said upper chamber, said lower chamber having an inlet, at least one electrical heating unit disposed in said lower chamber, and duct means connected to said inlet for passing pressurized air into said inlet where it passes through said lower chamber, across said electrical heating unit and



through said grate means and said bed of particulate material to fluidize said particulate material, said heating unit preheating the air as it passes through said lower chamber.

4,183,309

BUTTONHOLE SEWING MACHINE FOR SEWING EYE OR STRAIGHT BUTTONHOLES WITH OR WITHOUT A WEDGE BAR TACK

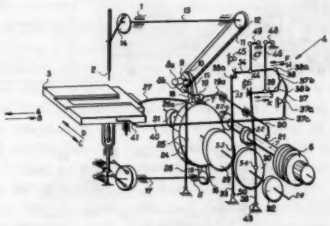
František Bajer; Josef Nejedlý, and Miloš Král, all of Prostejov, Czechoslovakia, assignors to Elitex, Koncern textilniho strojirenstvi, Liberec, Czechoslovakia

Filed Jan. 2, 1979, Ser. No. 434

Claims priority, application Czechoslovakia, Dec. 30, 1977, 9049/77

Int. Cl.[2] D05B *3/06*

U.S. Cl. 112—71 **3 Claims**



1. In a sewing machine for buttonhole bar tacking having an overarm, a support plate for the workpiece and mechanisms for imparting thereto motions necessary for bar tacking the straight sides, the eye and the wedge bar tack of the buttonhole, a first cam for forming the eye of the buttonhole, and a second cam for forming the wedge bar tack of the buttonhole, the improvement which comprises a first two-armed lever which is swingably mounted on a pivot immovable relative to the overarm of the sewing machine, one end of said first lever being coupled in its movement via further transmission elements with the support plate, while the other end of said first two-armed lever is made in the form of a pivot, a second two-armed lever of which one end is connected by an articulated joint with a first tie rod which is connected by disengageable articulated joint means with the first transmission lever coupled in its motion with the first cam for forming the eye of the buttonhole, the other end of the second two-armed lever being connected by an articulated joint with a second tie rod which is connected by an articulated joint disengageably with the second transmission lever which is coupled in its motion with the second cam for forming the wedge bar tack of the buttonhole, in the position of the first tie rod in which it is disengaged from the first transmission lever said first tie rod being rendered immovable relative to the overarm of the sewing machine, while in the position of the second tie rod when

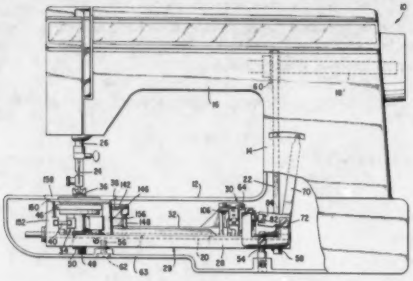
it is disengaged from the second transmission lever said second tie rod is rendered immovable relative to the overarm of the sewing machine, the active surface of the first cam for forming the eye of the buttonhole, as well as that of the second cam for forming the wedge bar tack of the buttonhole comprising sections which lie in a constant radial distance from the axis of rotation of the cam, each of said cams having at least one further section lying at a greater radial distance from the axis of rotation of the appurtenant cam.

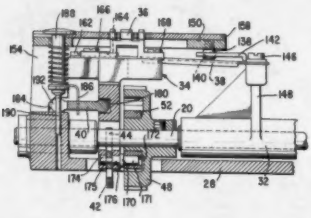
4,183,310

FEED AND LOOP TAKER MODULE FOR A SEWING MACHINE

Ralph E. Johnson, Convent Station, N.J., assignor to The Singer Company, New York, N.Y.

Filed Dec. 21, 1978, Ser. No. 971,961
Int. Cl.[2] D05B *57/14, 27/02*
U.S. Cl. 112—184 **15 Claims**





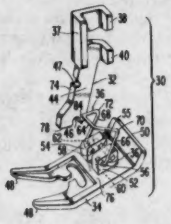
1. In a sewing machine, the combination comprising, a bed shaft; a feed dog; a feed bar to move the feed dog; means for actuating the feed bar to cause the feed dog to move in a work feeding direction including a rock shaft, means operably connected with the bed shaft for actuating the rock shaft in response to rotation of the bed shaft, and a flat spring connection between the rock shaft and feed bar permitting the feed bar and feed dog to move relative to the rock shaft in a direction which is perpendicular to the work feeding direction; means for moving the feed dog in said perpendicular direction including camming means operably connected with the feed bar and responsive to rotation of the bed shaft; a frame wherein the bed shaft, rock shaft, feed bar actuating means and means for moving the feed dog in the said perpendicular direction are supported; and guide means associated with the frame and feed bar for maintaining the feed dog level while permitting movement in the work feeding direction and relative to the rock shaft in said direction perpendicular to the work feeding direction.

4,183,311

SNAP-ON PRESSER FOOT PLATE

Warren D. Knowles, Clark, N.J., assignor to The Singer Company, New York, N.Y.

Filed Mar. 15, 1979, Ser. No. 20,672
Int. Cl.[2] D05B *29/06*
U.S. Cl. 112—235 **7 Claims**



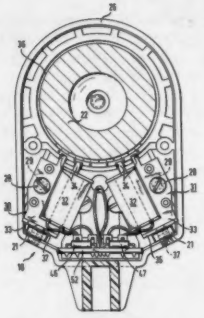
1. A presser device for a sewing machine having a presser bar thereon, said presser device including a shank which detachably connects with the presser bar and has a recess at the bottom end, a latching spring, and a sole plate connected to one end of the latching spring, the sole plate having a hinge pin thereon, said shank including a notch in one edge wherein the other end of the spring is disposed to stretch the spring and cause the spring to hold the hinge pin on the sole plate up in the recess at the bottom end of the shank.

4,183,312

SPEED-REGULATED SEWING MACHINE

Wolfgang Angersbach, Darmstadt, and Jürgen Scharffetter, Riedstadt, both of Fed. Rep. of Germany, assignors to Quick-Rotan Becker & Notz KG, Darmstadt, Fed. Rep. of Germany

Filed Dec. 8, 1978, Ser. No. 967,735
Claims priority, application Fed. Rep. of Germany, Dec. 10, 1977, 2755235
Int. Cl.[2] D05B *69/18*
U.S. Cl. 112—277 **10 Claims**



1. In a sewing machine having a main drive shaft, an improved rpm-regulated drive system, the drive system being of the type which comprises

a coupling motor unit which includes an output drive member drivingly coupled to the sewing-machine drive shaft, an electric motor having a constantly rotating output shaft, a braking structure, and electrically controlled electromagnet means for causing the output drive member to engage and become disengaged from the output shaft and the braking structure in order to increase and decrease the rotary speed of the output drive member and thereby of the main drive shaft of the sewing machine;

regulating means having an output connected to and con-

trolling the electromagnet means and having a first input for receipt of a desired-rpm command signal and a second input for receipt of an actual-rpm feedback signal;

and actual-rpm feedback transducer means, including a pole wheel rotating synchronously with the sewing-machine drive shaft, the pole wheel having a circumferential succession of transducer-detectable induction-modifying elements, a plurality of inductive pick-up transducers arranged along the periphery of the pole wheel and each responding to passage of the succession of induction-modifying elements by producing an A.C. output voltage whose amplitude is proportional to the rpm of the pole wheel, and connecting means connecting together the outputs of the plurality of inductive pick-up transducers to form a voltage constituting said actual-rpm feedback signal,

the improvement wherein

the inductive pick-up transducers are so spaced relative to the circumferential spacing of the induction-modifying elements of the pole wheel that the individual A.C. voltages induced in the individual pick-up transducers are phase-shifted relative to one another,

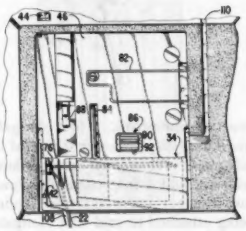
said connecting means comprising a plurality of rectifiers, one for each inductive pick-up transducer, each rectifying the output voltage of the respective transducer to form a respective pulsating rectifier output signal and means connecting together the outputs of the plurality of rectifiers and connecting them to said second input of the regulating means and operative for applying to the latter a sum signal which constitutes said actual-rpm feedback signal and is derived from the pulsating rectifier output signals by summation alone.

4,183,313

SEWING MACHINE CASSETTE THREADING SYSTEM

Charles R. Odermann, Lake Valhalla, and William L. Herron, Elizabeth, both of N.J., assignors to The Singer Company, New York, N.Y.

Filed Dec. 14, 1978, Ser. No. 969,612
Int. Cl.[2] D05B *43/00*
U.S. Cl. 112—302 **4 Claims**



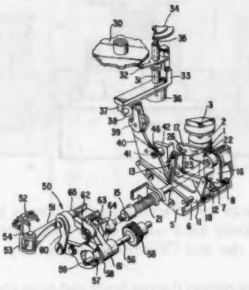
1. A sewing machine cassette threading system for supplying thread to a sewing machine having an arm, a spool holder mounted on said arm, a thread carrying stitch forming instrumentality, and thread manipulating elements associated with said stitch instrumentality carried in said arm, said cassette threading system comprising a cassette accommodating chamber formed in said arm having said thread manipulating elements located in said chamber, a first thread accommodating slot formed in said arm to provide a passageway for thread from said chamber to said thread carrying stitch forming instrumentality and a second thread accommodating slot defining a passageway for thread from said spool holder to said chamber in said arm, said second slot having an extremity terminating at said chamber, whereby said thread carrying stitch forming instrumentality may be threaded selectively from a spool of thread carried in said spool holder or from a thread supply contained in a cassette.

4,183,314

FEED CONTROL DEVICE FOR USE IN A SEWING MACHINE

Shuichi Sato, Utsunomiya, Japan, assignor to The Singer Company, New York, N.Y.

Filed Mar. 22, 1979, Ser. No. 22,905
Int. Cl.[2] D05B *27/22*
U.S. Cl. 112—316 **3 Claims**



1. In a sewing machine having stitch forming instrumentalities including a work feeding mechanism actuated cyclically in timed relation with said stitch forming instrumentalities, a feed regulator shaft, a feed regulator means operatively associated with said feed regulator shaft for selectively varying the direction and magnitude of work advance movement of said work feeding mechanism, an operator actuatable stitch length control including a camming device that may be set to a selected position for effecting control of said feed regulator means, at least one pattern cam and a cam follower individually selectively engageable with said at lease one pattern cam, a pattern cam linkage system operatively connecting said cam follower to said feed regulator means, wherein said feed regulator means comprises:

a. a four bar linkage operatively connected to said feed regulator shaft for imparting selective, angular motion thereto;

b. a tracking element associated with said four bar linkage and in cooperative engagement with said camming device for effecting manual control of said four bar linkage and thereby limiting said selective angular motion of said feed regulator shaft;

c. a proportional link directly actuated by said pattern cam linkage system and in cooperative engagement with said four bar linkage for effecting pattern cam control of said four bar linkage and thereby varying said selective angular motion of said feed regulator shaft in proportional relation to said selected position of said camming device for varying the direction and magnitude of work advance movement of said work feeding mechanism;

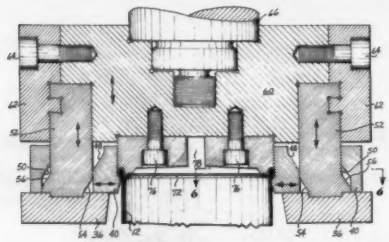
d. a reverse feed means actuated by said stitch length control in cooperative engagement with said four bar linkage for effecting manual reversal of said work advance movement of said work feeding mechanism in relation to said selected position of said camming device and independent of said pattern cam control.

4,183,315

METHOD AND APPARATUS FOR MAKING A CAN END SEAM

Roy E. Rogers, Longview, Wash., assignor to Weyerhaeuser Company, Tacoma, Wash.

Continuation of Ser. No. 828,572, Aug. 29, 1977, abandoned.
This application Oct. 3, 1978, Ser. No. 948,316
Int. Cl.[2] B21D *37/00*
U.S. Cl. 113—18 R **8 Claims**



1. An apparatus for attaching an end closure to a can body where the can body has a wiped down flange about the end to be closed and the end closure has a partially curled edge, comprising:

first means for raising the can body end to be closed together with an end closure atop said end to a position within a punch and curling assembly, said punch and curling assembly being supported in part on support and guide means having an aperture therein for relative travel therethrough of the can body and end closure,

second means in the punch and curling assembly, slidable radially inwardly atop said support and guide means, for positioning the curled edge of the end closure to a location adjacent the wiped down flange and the wiped down flange to a location substantially adjacent the surface of said can body,

third means in the punch and curling assembly, movable downwardly relative to said second means, for then moving the partially curled edge of the end closure downwardly toward a plurality of curling grooves, said curling grooves forming a substantially annular curling groove when said second means are in their radially innermost position, and

fourth means in the punch and curling assembly associated with said third means for bending the edge of the end closure around the substantially annular curling groove and upwardly into the annular slot of said wiped down flange as said third means continues its downward movement.

4,183,316

VARIABLE VOLUME DEPTH CONTROL

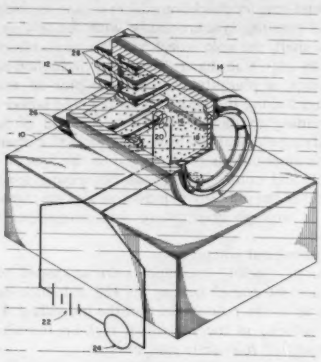
George J. Bennett, El Cajon, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Dec. 5, 1977, Ser. No. 857,720
Int. Cl.[2] B63B *39/04, 43/06*
U.S. Cl. 114—331 **9 Claims**

1. Apparatus for controlling the depth of an object submerged in a liquid medium, said apparatus comprising:

chamber means adapted to be joined to said object for retaining a working fluid, there being an aperture through said chamber means which is sealed by a flexible diaphragm which is in contact with said medium when said chamber means is submerged in said medium;

heat transfer means for increasing the buoyancy of said apparatus by heating said working fluid to urge said flexible diaphragm outwardly from the interior of said chamber means, and for decreasing the buoyancy of said apparatus by cooling said working fluid to urge said flexible



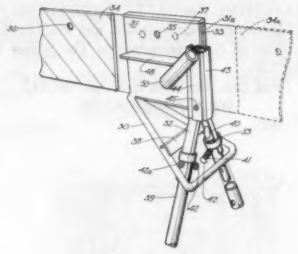
diaphragm inwardly toward the interior of said chamber means .

4,183,317

VERSATILE ALL PURPOSE BARRICADE STRUCTURES

George E. Follick, P.O. Box 15207, Wyoming, Ohio 45215

Filed Oct. 12, 1977, Ser. No. 841,294
Int. Cl.[2] E01F *9/10, 13/00*
U.S. Cl. 116—63 P **31 Claims**



1. A support structure comprising: a first elongated member adapted to be horizontally disposed; a first pair of legs secured adjacent an end of said first elongated member and extending downwardly therefrom; and a first triangular brace member comprised of a base member and two struts terminating in an apex, said apex being attached to said first elongated member inwardly from said end, said two struts extending downwardly and outwardly away from said end of said first elongated member and away from said attached apex, each leg of said first pair of legs being attached inside said first triangular brace member at a respective point removed from said apex, and extending beyond said base member.

4,183,318

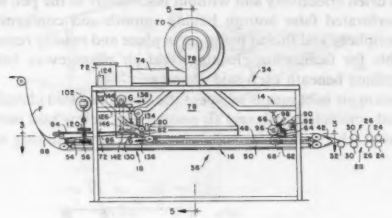
FOUR BELT CONVEYING MECHANISM FOR TUBULAR KNIT GUMMING AND SLITTING MACHINE

James R. Reynolds, Spartanburg, S.C., assignor to Milliken Research Corporation, Spartanburg, S.C.

Filed Apr. 26, 1978, Ser. No. 900,260
Int. Cl.[2] D06C *5/00;* **B05C** *11/00*
U.S. Cl. 118—34 **7 Claims**

1. Apparatus for continuously converting tubular knitted fabric to open-width form comprising: conveying means to convey the tubular knit fabric in distended form, means to

supply tubular knit fabric to said conveying means, said conveying means including at least two pairs of parallelling mounted endless belts, one pair of said belts being spaced laterally from the other pair of said belts, said means to supply tubular knit fabric including a means to guide the tubular knit fabric onto said belts, means mounted in cooperative relationship with said conveying means for successively applying a gumming composition, means for effecting setting thereof and



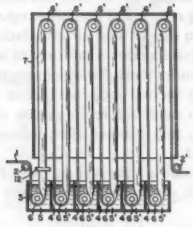
means for slitting the fabric longitudinally along the linear area of the gumming composition and means downstream of the slitting apparatus to take-up the slit fabric in open-width form, each of said pairs of belts including a long belt and a short belt, said short belt turning around at a point between the means to set the gumming composition and the means to slit to allow the fabric width to relax to eliminate the tendency of the fabric to curl when slit.

4,183,319

APPARATUS FOR COATING HOSE

Yasuo Sakurai, and Koji Kusumoto, both of Settsu, Japan, assignors to Ashimori Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Aug. 24, 1977, Ser. No. 827,357
Claims priority, application Japan, Aug. 24, 1976, 51-101322
Int. Cl.[2] B05C *3/15, 11/02*
U.S. Cl. 118—44 **13 Claims**



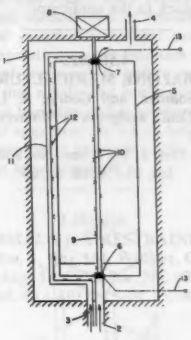
1. An applicator apparatus for uniformly distributing a viscous liquid on the surface of a travelling hose jacket wherein the viscous liquid penetrates the interstices of the hose jacket which comprises an expanding assembly adapted to be disposed in a fixed position within the hose jacket and a doctor assembly adapted to be disposed in a fixed position contiguous with the outside surface of the hose jacket and in operative, opposed association with the expanding assembly through the wall of said hose jacket, said expanding assembly comprising a mandrel having a plurality of expanding elements which are biased toward the opposed doctor assembly to form a generally cylindrical supporting surface within the hose jacket, and said doctor assembly comprising an elastic ring member adapted to be disposed around the outer surface of the hose jacket opposite to said expanding assembly for pressing the viscous liquid into the interstices of the hose jacket while removing excess viscous liquid from the outer surface of the hose jacket.

4,183,320

APPARATUS FOR NICKEL PLATING

Edwin Erben, and Ladislav Koydl, both of Munich, Fed. Rep. of Germany, assignors to Maschinenfabrik Augsburg-Nürnberg Aktiengesellschaft, Fed. Rep. of Germany

Filed Aug. 17, 1977, Ser. No. 825,472
Claims priority, application Fed. Rep. of Germany, Aug. 21, 1976, 2637836
Int. Cl.[2] B05B *1/02*
U.S. Cl. 118—725 **1 Claim**



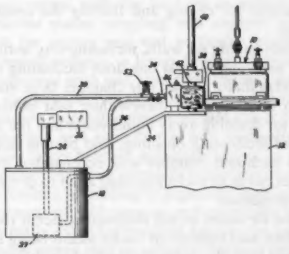
1. Apparatus for carrying out a method for nickel plating an electrically conductive centrifuging drum of a gas centrifuge, including the steps of passing an electrical current through the drum to heat it to a temperature between 150° and 200° C. and simultaneously subjecting the drum to a continuously flowing gas stream containing nickeltetracarbonyl and an entrainment gas, comprising a stationary reaction chamber with gas inlet means, a gas outlet, and first and second electrically conductive rotatable supports adapted to receive the centrifuging drum and connected to a circuit, one support being coaxial with the other and at least one support being capable of being rotated by driving means, said gas inlet means having two tubes, each provided with discharge ports, the first tube interconnecting the first and second supports along the axis of rotation whilst the second tube is stationary and arranged along the contour of the centrifuging drum with its discharge ports directed towards the drum.

4,183,321

GLUING MECHANISM FOR FINGER SLOTTING MACHINES

Harold R. Ziegelmeyer, 5010 Griffin Creek Rd., Medford, Oreg. 97501

Filed Mar. 16, 1978, Ser. No. 887,355
Int. Cl.[2] B05C *1/02*
U.S. Cl. 118—259 **2 Claims**



1. A finger slotting and glue applying machine, comprising

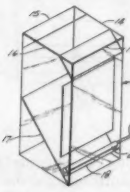
the combination with means for feeding finger slotted studs past a glue applying station, of a rotary circumferentially ribbed glue applicator at said station rotatable about a vertical axis which is perpendicular to the direction of advance of the studs, a glue delivering doctor block having interfitting relation with said rotatable applicator at said station, a glue pot, means for pumping glue from the glue pot through the doctor block to the applicator, and a vertically extending rotary valve mounted in the doctor block, which valve is manually settable to meter the delivery of glue uniformly at various chosen rates from the doctor block to the applicator.

4,183,322

ABALONE MARICULTURE

Fred T. Shultz, Sonoma, and George S. Lockwood, Carmel Valley, both of Calif., assignors to Monterey Abalone Farms, Monterey, Calif.

Filed Oct. 3, 1977, Ser. No. 838,456
Int. Cl.[2] A01K *61/00*
U.S. Cl. 119—4 **16 Claims**



1. A process for incubating abalone eggs which have been spawned and fertilized in a first confined body of seawater and growing the hatched larvae, which comprises the steps of:

(a) separating the fertilized eggs from the first body of seawater;

(b) cleaning the eggs to separate contaminating organic matter therefrom;

(c) placing the cleaned eggs in a second body of purified seawater for the period necessary for incubation and hatching and while holding the second body of seawater at substantially constant temperature;

(d) selectively transferring the resultant larvae substantially free of hatching debris to a third body of seawater; and

(e) holding the larvae in the third body of seawater until they are ready to metamorphose to a crawling animal while maintaining the third body of water at a constant temperature.

4,183,323

PET DRYER

Ben Maines, 1907 Judson Rd., Longview, Tex. 75601

Filed Aug. 15, 1977, Ser. No. 824,444
Int. Cl.[2] A01K *1/02, 13/00*
U.S. Cl. 119—19 **4 Claims**

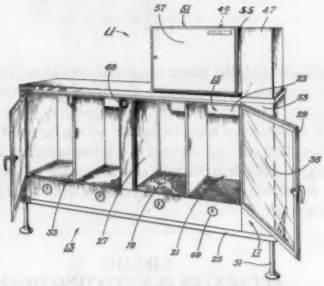
1. Apparatus for drying and fluffing the coating of a pet comprising:

a. a cabinet having six walls, including top, bottom, a plurality of sides and at least one door facilitating entry of said pet and defining at least one chamber large enough for the pet to stand upright therewithin; said bottom having a drain for draining away liquid water and the like from the pet and facilitating cleaning, said bottom being disposed below each said chamber with no chamber disposed over another, so as to avoid exposing a pet to droppings from a pet thereabove;

b. exhaust air outlet means disposed adjacent the top of said chamber; said exhaust air outlet means being elongate and disposed such that even if a vertical partition is inserted to divide said chamber into two chambers, said exhaust air is flowed in parallel from each said chamber and without passing in series from one said chamber and pet to another said chamber and pet;

c. perforated false bottom disposed in said chamber above the bottom thereof so as to define an air passageway and still allow room for said pet to stand on said perforated false bottom; said perforated false bottom having openings smaller than the feet of said pet so as to prevent protrusion of the pet's feet therethrough yet allow passage of warm air upwardly around said pet such that long hair on a pet is dried effectively and without discomfort to the pet; said perforated false bottom having smooth and conforming periphery and fit and being set in place and readily removable for facilitating cleaning; said air passageway being defined beneath each said chamber;

d. warm air inlet means adjacent the bottom of said chamber and connected with said air passageway below said perforated false bottom for supplying warm air for drying and



fluffing the coating of said pet; a duct means being connected with said warm air inlet means, heating means disposed in fluid communication with said duct means such that air is warmed before being circulated past said false bottom and upwardly past said pet, and a high volume air circulation means being connected with said duct means for circulating air in heat exchange relationship with said heating means and thereafter upwardly past said pet; the upstream side of said air circulation means being connected at a first location exteriorly of said cabinet and said exhaust air outlet means being connected exteriorly of said cabinet at a second location spaced from said first location so as to minimize recirculation of the moist air discharged from said cabinet after having been flowed past said pet; and

e. a transparent window disposed in one of said walls for viewing said pet during the drying and fluffing of its coating.

4,183,324

CONCRETE SLOTTED FLOOR INCLUDING WOODEN INSERT

Paul J. Nobbe, R.R. 2, Brookville, Ind. 47012

Division of Ser. No. 817,847, Jul. 21, 1979, which is a continuation-in-part of Ser. No. 763,844, Jan. 31, 1977, which is a continuation of Ser. No. 542,167, Jan. 20, 1975, which is a division of Ser. No. 457,068, Apr. 1, 1974, Pat. No. 3,915,422. This application Aug. 25, 1978, Ser. No. 936,704
Int. Cl.[2] A01K *1/015, 1/02*
U.S. Cl. 119—20 **2 Claims**

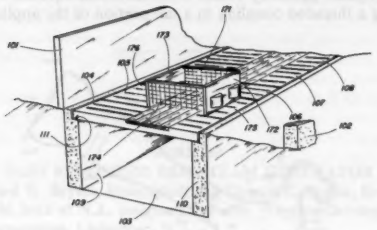
1. A farrowing construction comprising:

a plurality of concrete floors adapted to be placed over a pit to support animals, each of said floors having a plurality of concrete slats with first convex top crowns, said slats being spaced apart by slots to allow animal droppings to pass through said slots and with said slats having portions integrally joined to adjacent slats, said floors extending

longitudinally across said pit and including upwardly facing sections recessed below said crowns;

insert means removably mounted to said floors and positioned in said sections upon which animals may be located during nursing;

first means located above said floors to limit movement of some of said animals atop said insert means; and



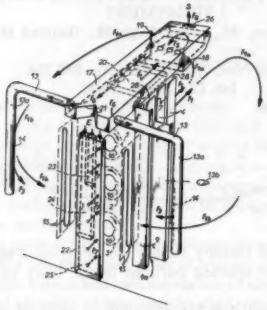
second means cooperating with said insert means and said floors to limit relative movement therebetween, and wherein said floors have opposite ends with said upwardly facing sections located intermediate thereof, said slats extend longitudinally through said sections and have second convex top crowns positioned beneath said first convex top crowns spacing said insert means partially apart from said floors insuring air circulation therebetween.

4,183,325

EGG INCUBATOR

Bernard M. R. Destouches, and Gilbert Esther, both of Mettray, France, assignors to Bekoto, Mettray, France

Filed Mar. 2, 1978, Ser. No. 882,693
Claims priority, application France, Mar. 4, 1977, 77 06519
Int. Cl.[2] A01K *41/02*
U.S. Cl. 119—37 **7 Claims**



1. An egg incubator comprising

a cabinet having a front face with at least one door thereon;

at least three series of carriages with drawers to hold eggs introduced into said cabinet through said at least one door and including

a central series of carriages,

a side series of carriages arranged on both sides of said central series of carriages;

means providing a principal flow of air from a rear to front direction in said cabinet,

directing-distributing means to direct said principal flow of stirring air towards said front face through said central series of carriages and to distribute by division a part of the principal flow to each of said side series of carriages;

moist air distributing means including

moisture dispensing means,

and downwardly directed arms forming an inverted U extending below the flow of stirring air and having slots extending along said arms, to mix moist air into the stirring air flow by drawing the moist air from said slots by the flow movement of the stirring air during a return portion of the flow pattern;

said means providing a principal flow of air including

a vertical bank of ventilators located to cooperate with said directing-distributing means;

fresh air intake and temperature regulating units associated with said vertical bank of ventilators;

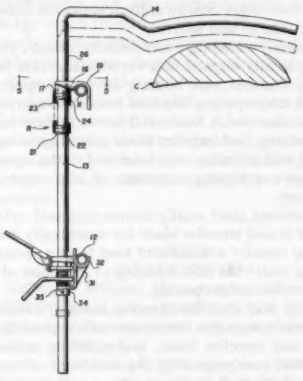
said arms of said inverted U located remotely from said temperature regulating unit to facilitate the mixing of the return flow with the moist air before reaching said regulating unit so that a balanced horizontal flow of stirring air, regulated in humidity and in temperature, is delivered to the group of eggs over the whole height of the incubator without there being any zone of the enclosure formed by said cabinet left unreached.

4,183,326

ANIMAL KICK RESTRAINER

Charlie R. Wills, Rte. 1, Box 144, Willows, Calif. 95988

Filed Aug. 14, 1978, Ser. No. 933,585
Int. Cl.[2] A01K *15/04, 29/00*
U.S. Cl. 119—96 **10 Claims**



1. An apparatus for restraining an animal such as a cow from kicking arranged to be detachably mounted on upper and lower bars disposed in parallel, vertically spaced apart relationship adjacent the animal to be restrained comprising, in combination, a vertically extending support rod, an upper bracket adapted for overlying engagement with said upper bar and slidably mounted on said support rod, a laterally extending restraining member on the upper end of said support rod for overlying engagement with the back of an animal to be restrained, yieldable means coupling said support rod to said upper bracket for urging said rod vertically upward into a normally extended position, a lower bracket adapted for underlying engagement with said lower bar slidably mounted on said support rod in underlying, spaced apart relationship with said upper bracket, releasable means on said lower bracket for yieldingly retaining said support rod in a vertically adjusted position on said lower bracket, actuating means on said lower bracket moveable between a normally inoperative position and an operative position in binding engagement with said support rod for movement of said support rod vertically downward from said normally extended position against the urging force of said yieldable means into an adjusted vertical position with said restraining member in restraining engagement with the back of said animal and means for releasing said releasable

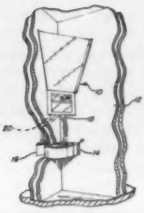
means to permit said rod to move vertically upward into said normally extended position under the urging force of said yieldable means.

4,183,327

HORSE-FEEDING APPARATUS

Edward C. Olsen, 1109 S. 17th St., Escanaba, Mich. 49829

Filed Jul. 25, 1977, Ser. No. 818,736
Int. Cl.[2] A01K *5/00*
U.S. Cl. 119—51.11 **8 Claims**



1. A system for automatically dispensing horse feed ccomprising:

a feed storage chamber having an upper access port, a lower aperture and a plurality of side surfaces including at least one which converges downwardly toward the others to channel the feed to said aperture,

feed transfer means including a substantially closed cylindrical housing axially aligned in a vertical direction below said storage chamber, said housing having an upper surface with an inlet opening disposed below the aperture of said storage chamber, a horizontal lower surface having an outlet opening, and impeller blade means spanning the diameter of said cylinder, said inlet and outlet openings being in non-overlapping segments of said upper and lower surfaces,

a vertically disposed shaft axially intersecting said cylinder and coupled to said impeller blade for rotationally driving said blade to transfer a volume of feed from a section of said housing under the inlet opening to a section of said housing over the outlet opening,

means driven by said shaft for agitating the feed within the storage chamber near the lower aperture thereof during rotation of said impeller blade, said agitating means including at least one projecting finger element driven by said shaft and adapted to sweep across said converging surface in close proximity thereto,

a timer-controlled drive mechanism coupled to said shaft for actuating said agitating means and said impeller blade at predetermined intervals and for a predetermined period and feed serving means for receiving the feed from said housing outlet opening for consumption.

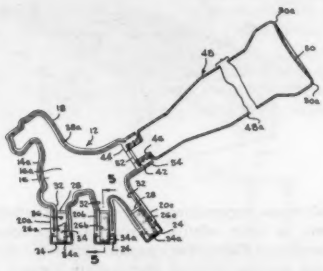
4,183,328

APPLICATOR AND CONTAINER ASSEMBLY FOR APPLYING LIQUID COMPOSITIONS TO PET ANIMALS AND THE LIKE

Frank S. Lawrence, Adamstown, Md., assignor to Pet Aids Ltd., Inc., Leesburg, Va.

Filed May 22, 1978, Ser. No. 908,444
Int. Cl.[2] A01K *13/00*
U.S. Cl. 119—156 **5 Claims**

1. A dispenser applicator and flexible walled container assembly for applying liquid compositions such as anti-tick and anti-flea compositions and the like to the skin of pet animals, comprising an applicator unit molded in the configuration of the kind of pet animal to be treated and shaped to include a body portion defining a hollow chamber to receive the liquid composition and a plurality of hollow legs resembling the pet animal's legs extending therefrom in liquid communication with the chamber along generally parallel, laterally spaced paths forming coarse combing members to spread the animal's hair into furrows, the hollow legs forming tubular conduits for the liquid composition and having elongated felt pad members fixed in lower foot end portions of the legs in liquid communication with the composition in said chamber and protruding therefrom to contact the animal's skin and transfer the liquid composition thereto, the flexible walled container comprising an elongated generally round cross-sectioned squeeze bottle having a threaded coupling to a tail portion of the applicator



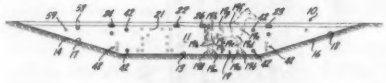
unit and a fluid communication passage with the hollow chamber of the applicator unit, the lower foot end portions of the hollow legs having downwardly opening socket cavities shaped in cross-section to conform to the cross-sectional shape of the felt pad members to receive the major portion of the axial length of the pad members therein and having an annular abutment shoulder forming the upper end of the respective socket cavity and providing a center opening for passage of the liquid composition from the hollow chamber to the pad members to be absorbed thereby, and said felt pad member being an elongated felt body sheathed with a nylon mesh sheath.

4,183,329

WHIRLPOOL THERAPY FACILITY AND METHOD OF TREATMENT

Angelo Leonaggeo, Jr., Seven High St., Bedford Hills, N.Y. 10507

Filed Nov. 7, 1977, Ser. No. 849,256
Int. Cl.[2] A61D *11/00*
U.S. Cl. 119—158 **12 Claims**



1. A whirlpool therapy facility for applying water turbulence massage to selected portions of the body of a horse, comprising:

a channel shaped tub for containing a pool of water and having a substantially flat horizontal bottom positioned between a pair of opposed upstanding wall members;

a pair of inclined ramps extending between the wall members laterally outwardly and upwardly in opposite directions from the bottom of the tub to provide ingress and egress passages thereto;

a plurality of output nozzles carried by each of the wall members and opening into the pool, the nozzles being arranged in an inverted substantially U-shaped pattern on each of the wall members and arranged to correspond approximately to the relative positions of the legs and torso of a horse standing on the bottom, including at least one separate nozzle on each wall positioned to direct a water turbulence massage at each of the following areas of the horse: the shank, the knee, the forearm and elbow

area, the chest, the shoulder, the haunch, the thigh, and with respect to the rear leg, the stifle, the gaskin, the hock, and the fetlock and pastern portions; and

means for injecting water into the pool under pressure through selected ones of said nozzles, thereby to provide turbulence in the pool for massaging portions of the body of a horse situated in the tub between the wall members.

4,183,330

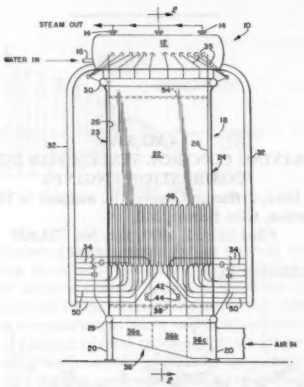
FAST FLUIDIZED BED STEAM GENERATOR

Richard W. Bryers, Flemington, and Thomas E. Taylor, Bergenfield, both of N.J., assignors to Foster Wheeler Development Corporation, Livingston, N.J.

Filed Dec. 28, 1977, Ser. No. 865,289

Int. Cl.[2] F22B *1/02*; F23D *19/02*

U.S. Cl. 122—4 D **23 Claims**



1. A heat exchange system comprising:

a boiler having a combustion chamber and a first series of heat transfer elements disposed around the periphery of said combustion chamber;

a layer of heat generating materials disposed adjacent to the lower portion of said boiler, and including a fuel material and an inert material;

a second series of heat transfer elements disposed within said chamber and above said layer of heat generating materials to define a space between the surface of said layer and said second plurality of heat transfer elements;

means for introducing combustion supporting air at an increased velocity through said layer of heat generating materials to support the combustion of said fuel material and to fluidize said layer into a dense-phase fluidized bed of relatively coarse materials, said increased velocity air entraining particles of said inert material in the space above said layer to provide heat to said second series of heat transfer elements;

a plurality of aligned slots formed by the angular displacement from the plane of said combustion chamber of selected ones of said first series of heat transfer elements for permitting the removal of said entrained particles from said combustion chamber; and

an exhaust duct in communication with said plurality of aligned slots.

4,183,331

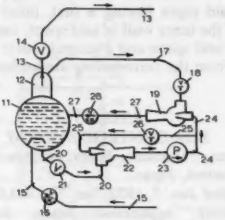
FORCED CIRCULATION STEAM GENERATOR

Francis R. Hull, 567 E. 26th St., New York, N.Y. 11210

Continuation-in-part of Ser. No. 651,776, Jan. 23, 1976, abandoned, which is a division of Ser. No. 469,475, May 13, 1974, Pat. No. 3,934,799, which is a continuation-in-part of Ser. No. 284,166, Aug. 23, 1972, abandoned. This application Feb. 10, 1978, Ser. No. 877,034

Int. Cl.[2] F22D *1/28*

U.S. Cl. 122—442 **7 Claims**



1. Forced circulation steam generating apparatus comprising in combination; a steam generator or boiler member having integral heating processes; a circulating liquid pump; a water-jet ejector-type contact heat exchanger which provides a motive-nozzle supply inlet, a receiver-side steam suction inlet, and a discharge outlet therefrom; communicating means between the water body of said steam generator member and the inlet of said circulating pump; discharge conduit communicating between the outlet of said circulating pump and the motive-nozzle inlet of said ejector heat exchanger; means for transferring heating steam generated by said steam generator or boiler member into the suction inlet of said ejector heat exchanger; and communicating means between the discharge outlet of said ejector heat exchanger and the water body of said steam generator member.

4,183,332

INTAKE SYSTEM

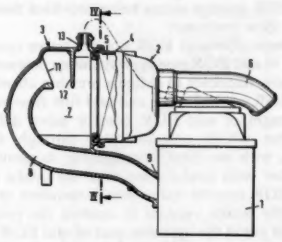
Peter Hofbauer; Wilhelm Heimermann; Dieter Gummer, and Michael Willmann, all of Wolfsburg, Fed. Rep. of Germany, assignors to Volkswagenwerk Aktiengesellschaft, Wolfsburg, Fed. Rep. of Germany

Filed Jan. 19, 1978, Ser. No. 871,089

Claims priority, application Fed. Rep. of Germany, Jan. 20, 1977, 2702160

Int. Cl.[2] F02B *75/18*

U.S. Cl. 123—52 M **12 Claims**



1. An intake system for a multicylinder internal combustion engine, in particular a compression ignition (Diesel) engine, said system comprising:

(a) an air filter housing adapted for holding an air filter cartridge such that air flows through the filter cartridge in the longitudinal direction, said air filter housing including:

(1) an air filter cover adapted to accommodate the filter cartridge and having a fresh air inlet pipe; and

(2) a one-piece, bottom part forming the filtered air side of the housing and enclosing an interior space which, as viewed in the direction of longitudinal air flow, directly follows said filter cartridge and serves both as an intake silencer and an intake manifold; and

(b) a plurality of intake pipes arranged side by side, each having an outlet end leaping separately to an individual cylinder of the engine and an inlet end opening directly into said interior space of said housing, said intake pipes extending around and within said bottom part space, and each of said pipes having a first, inner wall forming a portion of the inner wall of said space, and separating said pipe from said space and a second, outer wall, separating said pipe from the surrounding atmosphere.

4,183,333

EGR CONTROL SYSTEM

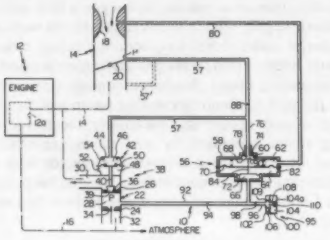
Syunichi Aoyama, Yokohama, Japan, assignor to Nissan Motor Company, Limited, Japan

Filed Jun. 7, 1978, Ser. No. 913,037

Claims priority, application Japan, Jun. 27, 1977, 52/83612[U]

Int. Cl.² F02M *25/06*

U.S. Cl. 123—119 A **11 Claims**



1. An exhaust gas recirculation (EGR) control system in combination with an internal combustion engine including a combustion chamber, an intake passageway providing communication between the atmosphere and the combustion chamber, a venturi formed in the intake passageway, a throttle valve rotatably disposed in the intake passageway downstream of the venturi, and an exhaust gas passageway providing communication between the combustion chamber and the atmosphere, said EGR control system comprising:

EGR passageway means providing communication between the exhaust gas passageway and the intake passageway to recirculate exhaust gas back to the combustion chamber, said EGR passage means being provided thereinside with a first flow restrictor;

a diaphragm operated EGR control valve operatively disposed in said EGR passageway means downstream of said first flow restrictor to define a pressure chamber between said EGR control valve and said first flow restrictor, the diaphragm of said EGR control valve defining a first chamber which communicates through first passage means with the intake passageway to provide the first chamber with intake vacuum in the intake passageway, said EGR control valve being operative in accordance with the intake vacuum to control the pressure of the exhaust gas in the upstream part of said EGR passageway means to control the flow of the recirculated exhaust gas;

regulating means for regulating the intake vacuum to be provided to the first chamber of said EGR control valve in accordance with the exhaust gas pressure in the upstream part and in accordance with the vacuum in the venturi, said regulating means including second passage means connecting to said first passage means and having an inlet port communicating with the atmosphere, a pressure regulating valve head movable relative to said inlet port of said second passage means for controlling the flow of atmospheric air bled through said inlet port into said second passage means, first and second flexible diaphragms defining, respectively, a second chamber communicating with said venturi and a third chamber communicating through third passage means with the pressure chamber of said EGR passageway means, said first and second flexible diaphragms operatively connect to each other and being operatively connected to said pressure regulating valve head to operate said pressure regulating valve head in response to the pressures in said second and third chambers;

a second flow restrictor formed in the third passage means to prevent said second flexible diaphragm from being damaged by exhaust pressure pulsation transmitted from said EGR passageway; and

valve means for inducting atmospheric air into the third passage means when the pressure in the third passage means is below atmospheric pressure.

4,183,334

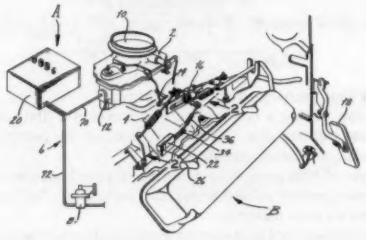
FUEL SAVING CONTROL SYSTEM FOR INTERNAL COMBUSTION ENGINES

Max Van Dine, Jefferson County, Ill., assignor to The Vapolean Corporation, Glen Burnie, Md.

Filed Mar. 2, 1977, Ser. No. 773,609

Int. Cl.² F02M *7/00*

U.S. Cl. 123—119 EC **18 Claims**



1. In combination with an internal combustion engine of the spark ignition type and having a carburetor which is connected with a throttle and derives fuel of a fluent consistency from a primary fuel line that is connected with a source of such fuel, a control system to control the amount of fuel supplied to the carburetor, said control system comprising: a plurality of secondary fuel lines into which the primary fuel line is divided, one of the secondary fuel lines being continuously open while the engine is operating; electrically operated means in another of the secondary fuel lines for altering the amount of fuel delivered to the carburetor, the electrically operated means being responsive to electrical signals; and sensing means connected with and operated by the throttle for sending electrical signals to the electrically operated means such that the electrically operated means permits a greater amount of fuel to flow to the carburetor at higher throttle settings than at lower throttle settings.

4,183,335

EXHAUST GAS SENSOR OPERATING TEMPERATURE DETECTION FOR FUEL MIXTURE CONTROL SYSTEM

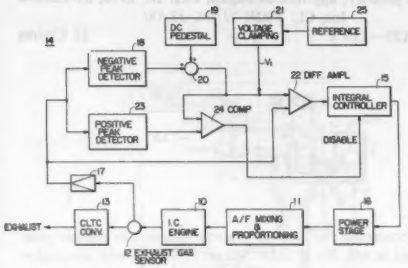
Masaharu Asano, Yokosuka, and Akio Hosaka, Mori, both of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

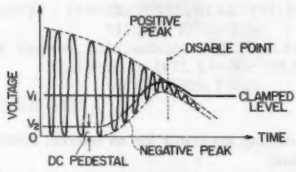
Filed Dec. 23, 1977, Ser. No. 863,958

Claims priority, application Japan, Dec. 27, 1976, 51/156583

Int. Cl.[2] F02B *3/00*

U.S. Cl. 123—119 EC **3 Claims**





1. In a mixture control system for an internal combustion engine having an exhaust gas sensor for supplying a control signal to the mixture control system, a detection system for detecting when the temperature of the gas sensor is at or above its operating temperature to allow said mixture control system to operate in a closed control mode and generating a disabling signal to operate said control system in an open mode when the temperature of the gas sensor is below its operating temperature, wherein said gas sensor is operable to generate low and high voltage signals in response to the presence and absence, respectively, of a predetermined constituent gas in the exhaust gases when operating at or above its normal operating temperature, said gas sensor having an internal impedance varying inversely with the temperature of said gas sensor from a very high impedance at its low, nonoperable temperature to a very low impedance at its high operating temperature, wherein said high voltage signal decreases with said internal impedance and said low voltage signal increases to approach said decreasing high voltage signal and then decreases with said internal impedance, said detection system comprising:

a differential amplifier having a first input terminal receptive of the output from sad exhaust gas sensor and a second input terminal receptive of a variable reference voltage for generating a differential signal;

a source of voltage of a magnitude intermediate the magnitudes of said high and low voltage signals which will be generated when said exhaust gas sensor is operating at or above its normal operating temperature;

means for detecting said low voltage signal;

means for adding a predetermined constant DC voltage to said detected low voltage signal;

said variable reference voltage being the one of the output from said adding means and said intermediate voltage which is greater than the other;

means for detecting said high voltage signal; and

a comparator for generating a comparator output when said variable reference voltage is greater than the detected high voltage signal, said comparator output being said disabling signal.

4,183,336

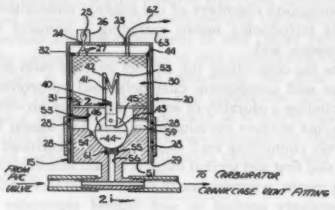
FUEL-AIR CONTROL DEVICE

Juanita Norman, Westlake Village, Calif., assignor to Ecotroleum, Inc., Cincinnati, Ohio

Filed Dec. 19, 1977, Ser. No. 861,902

Int. Cl.[2] F02M *25/06*

U.S. Cl. 123—119 B **12 Claims**



1. A device for aiding in the control of the fuel-air mixture in an internal combustion engine having a ventilation passage from the crankcase of said engine to the intake manifold, said device comprising:

(a) A valve housing having a seat coupled to an air passage, said air passage adapted for communication between the ambient and said ventilation passage;

(b) a solenoid means; activated whenever the revolutions per minute of said internal combustions exceed 2000;

(c) a valve means for seating in said seat thereby preventing ambient air from flowing into said air passage, said valve means coupled to said solenoid such that upon activation, ambient air flows into said ventilation passage.

4,183,337

AIR-FUEL MIXTURE RATIO CONTROL USING ELECTROSTATIC FORCE

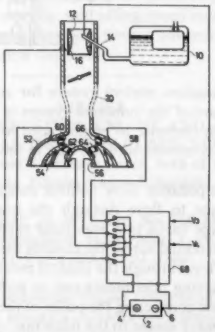
Hiroyuki Maruoka, Yokohama, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed Apr. 5, 1977, Ser. No. 784,722

Claims priority, application Japan, Apr. 6, 1976, 51-37729; Apr. 6, 1976, 51-37730; May 6, 1976, 51-50935; Jun. 28, 1976, 51-75584

Int. Cl.[2] F02M *7/00*

U.S. Cl. 123—119 E **39 Claims**



1. Arrangement for use with an internal combustion engine

having a plurality of combustion chambers, comprising in combination:

means for forming a combustible air-fuel mixture from a liquid fuel;

electrostatic charging means having first and second outputs for supplying first and second electrostatic charges with opposite polarity;

a first electrode connected to the electrostatic charging means for imparting the first charge to the liquid fuel to produce ionized fuel droplets in the combustible air-fuel mixture forming means;

means communicating with the combustible air-fuel mixture forming means for introducing the air fuel mixture into the combustion chambers of the internal combustion engine, said introducing means including a plurality of intake passages; and

means for controlling the air-fuel mixture ratio introduced into said combustion chambers, said controlling means including a plurality of second electrodes provided in the air-fuel mixture introducing means, and means for selectively connecting each of said second electrodes to either of said first and second outputs of said electrostatic charging means, whereby one of said first and second charges is selectively applied to said second electrodes and the amount of ionized fuel droplets introduced into each of said combustion chambers is controlled by means of electrostatic forces.

4,183,338

COMBUSTION CONTROL SYSTEM ADDING A LIQUID, EXHAUST GASES, AND PCV GASES

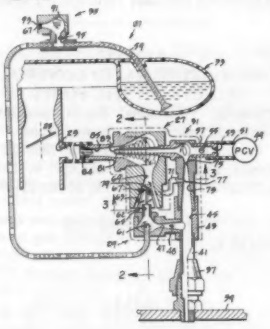
John E. Lindberg, Berkeley, Calif., assignor to U.S.A. 161 Developments Ltd., Berkeley, Calif.

Filed May 4, 1977, Ser. No. 793,555

The portion of the term of this patent subsequent to Sep. 12, 1995, has been disclaimed.

Int. Cl.[2] F15C *1/16*

U.S. Cl. 123—119 A **42 Claims**



5. A combustion control system for adding a fluid to the air-fuel mixture of the induction system of an internal combustion engine in response to engine need for the added fluid to improve the combustion of the fuel in the engine, said system comprising

variable impedance flow control means for producing an impedance to flow through the control means, which impedance varies in a non-linear relationship to the pressure differential across the control means and an acceleration of flow through the control means, said flow control means having inlet means and an outlet,

outlet means connecting the outlet of the variable impedance flow control means to the induction system of the engine, and

input means for supplying a liquid and engine exhaust gas to the inlet means of the variable impedance flow control means.

4,183,339

ELECTROSTATIC FUEL ATOMIZING APPARATUS FOR INTERNAL COMBUSTION ENGINE

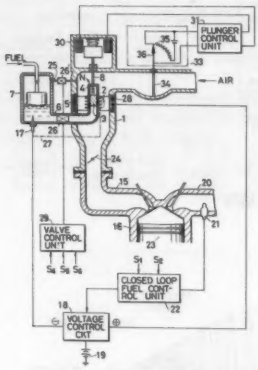
Hatuo Nagaishi, and Suzuo Suzuki, both of Yokosuka, Japan, assignors to Nissan Motor Company, Limited, Japan

Filed Oct. 17, 1977, Ser. No. 843,025

Claims priority, application Japan, Oct. 18, 1976, 51-123854

Int. Cl.[2] F02B *51/04, 33/00*

U.S. Cl. 123—119 E **21 Claims**



1. A fuel atomizing apparatus for an internal combustion engine, comprising:

(a) nozzle means disposed in the intake passage of said internal combustion engine, said nozzle means comprising a tubular member which includes a plurality of nozzles formed longitudinally and radially on a peripheral wall thereof, said tubular member being fluidly connected via a fuel conduit to a source of fuel;

(b) electrode means so constructed and arranged to induce said fuel to discharge from said nozzle means when supplied with a high voltage;

(c) sensor means for producing a signal inductive of the flow rate of the intake air of said engine;

(d) piston means slidably accommodated in said tubular member; and

(e) motor means responsive to said signal for actuating said piston means so that said piston means moves longitudinally in said tubular member, and the distance of the movement of said piston varies in accordance with the magnitude of said signal derived from said sensor means.

4,183,340

SPARK IGNITION SYSTEMS FOR INTERNAL COMBUSTION ENGINES

Brian Gilbert, Sutton Coldfield, England, assignor to Lucas Industries Limited, Birmingham, England

Filed Jul. 12, 1977, Ser. No. 815,039

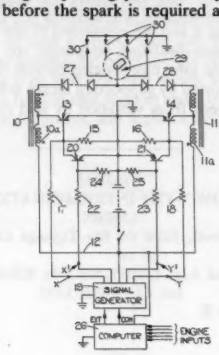
Claims priority, application United Kingdom, Jul. 24, 1976, 30987/76

Int. Cl.[2] F02P *3/04*

U.S. Cl. 123—148 DS **11 Claims**

1. A spark ignition system for an internal combustion engine comprising a pair of inductors, means for transferring energy stored in each inductor, when current flowing therethrough is interrupted, to a common spark circuit, a pair of semiconductor switch devices associated with the inductors respectively and controlling current flow therethrough and a control circuit means for said switch devices operating when a normal

spark is required to switch one of said devices on and then off and when a prolonged sparking period is required to switch both devices on before the spark is required and then repeatedly switch the switch devices on and off alternately so that whenever one device is on the other is off, for as long as the spark is required.



4,183,341

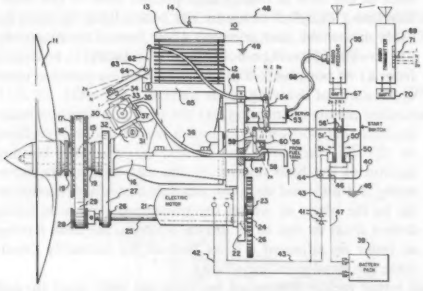
REMOTELY CONTROLLED STARTING SYSTEM FOR MODEL ENGINES

Fred R. Eastman, 133 Cambridge Dr., Irwin, Pa. 15642

Filed May 23, 1977, Ser. No. 799,543

Int. Cl.[2] F02N *17/00*

U.S. Cl. 123—179 A **8 Claims**



1. In a starting system for internal combustion engines for model vehicles of the type including airplanes, helicopters, autos and boats, in which the engines have a chamber and a power responsive element operating therein, a carburetor having a fuel supply line and an air intake which carburetor supplies a combustible fuel-air mixture to said engine chamber, the improvement comprising an electric starting motor on the vehicle, a torque-amplifying drive mechanism including an over-running clutch by which said motor drives said element to start the engine, a battery on the vehicle, an energizing circuit connecting said battery to said motor and including a starting switch device movable between a first position effective to cause operation of said motor to crank said element and a second position to terminate operation of the motor, a glow plug for firing a fuel-air mixture in said engine, means providing a voltage drop substantially equal to the voltage drop in said glow plug in said energizing circuit in parallel with said glow plug, and an actuator having a neutral position and being actuable out of said neutral position to effect closure of said starting switch.

3. In a starting system for internal combustion engines for model vehicles of the type including airplanes, helicopters, autos and boats, in which the engines have a chamber and a power responsive element operating therein, a carburetor having a fuel supply line and an air intake which carburetor supplies a combustible fuel-air mixture to said engine chamber, the improvement comprising an electric starting motor on the vehicle, a torque-amplifying drive mechanism including an over-running clutch by which said motor drives said element to start the engine, a battery on the vehicle, an energizing circuit connecting said battery to said motor and including a normally open starting switch device effective when closed to cause operation of said motor to crank said element, a choke member for controlling the air intake into said carburetor, and an actuator having a neutral position and being actuable out of said neutral position to effect simultaneously the closure of said starting switch and the movement of said choke member to restrict the amount of air intake to said carburetor, wherein a cut-off valve is provided for restricting the flow of fuel through said fuel supply line to said carburetor, and wherein said actuator is actuable to a position in which it causes said cut-off valve to restrict flow of fuel through the fuel supply line to said carburetor while effecting closure of said starting switch device.

4,183,342

FUEL INJECTION SYSTEM FOR COMPRESSION IGNITION (DIESEL) INTERNAL COMBUSTION ENGINES

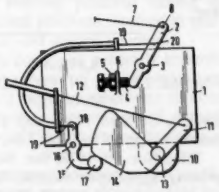
Ingolf Lohner, Braunschweig, Fed. Rep. of Germany, assignor to Volkswagenwerk Aktiengesellschaft, Wolfsburg, Fed. Rep. of Germany

Filed Jan. 12, 1978, Ser. No. 868,736

Claims priority, application Fed. Rep. of Germany, Jan. 15, 1977, 2701531

Int. Cl.[2] F02D *1/02*

U.S. Cl. 123—179 L **3 Claims**



1. A fuel injection system for a compression ignition (Diesel) internal combustion engine comprising a fuel injection pump; means associated with said injection pump for increasing the idling speed of the engine during cold starting; and means associated with said injection pump for advancing the injection timing during cold starting; said idling speed increasing means being coupled to said injection timing advancing means for simultaneous operation therewith.

4,183,343

INTERNAL COMBUSTION ENGINE AND A METHOD OF OPERATING AN INTERNAL COMBUSTION ENGINE

Toshio Tanahashi, and Yoshiharu Sakai, both of Toyota, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Apr. 20, 1977, Ser. No. 789,237

Claims priority, application Japan, Mar. 1, 1977, 52/20823

Int. Cl.[2] F02B *23/00, 3/00*

U.S. Cl. 123—191 S **6 Claims**

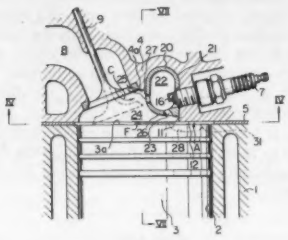
1. An internal combustion engine comprising:

a cylinder block having a cylinder bore therein;

a piston reciprocally movable in said cylinder bore and having a raised portion which is of substantially flat cres-

cent shape extending radially inwardly from one side thereof;

a cylinder head mounted on said cylinder block and having an inner substantially flat crescent shaped surface portion which is coextensive with and faces the raised portion of said piston and defines therewith an immediately closely spaced relation a narrow ignition space between said inner surface portion and the top surface of said piston when said piston reaches the top dead center position, said piston and said cylinder head defining a combustion chamber separate from and in direct fluid communication with said ignition space, means defining a recess in said inner



surface portion which extends therein in a direction away from said piston;

an intake valve, movably mounted on said cylinder head, through which a combustible fuel mixture is introduced into said combustion chamber;

an exhaust valve, movably mounted on said cylinder head, for discharging exhaust gas from said combustion chamber; and

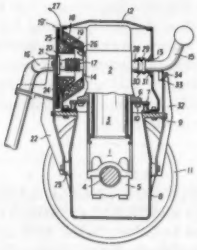
ignition means in said recess for igniting the combustible mixture in said ignition space to inject a burning fuel jet from said ignition space into and towards said combustion chamber.

4,183,344

LOW-NOISE LEVEL INTERNAL COMBUSTION ENGINES

Karl Kirchweger; Gerhard Thien, and Heinz Fachbach, all of Graz, Austria, assignors to Hans List, Graz, Austria

Filed Nov. 20, 1978, Ser. No. 962,115
Claims priority, application Austria, Nov. 23, 1977, 8414/77
Int. Cl.[2] F02B *77/00*
U.S. Cl. 123—198 E **5 Claims**



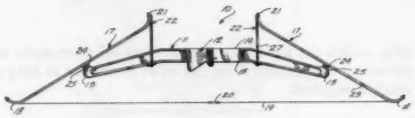
1. An internal combustion engine comprising an engine unit support, cylinder, cylinderhead and auxiliary units connected to the cylinder or to the cylinderhead, said engine parts being directly affected by body resonance and sound vibration, further comprising a crankcase, a flywheel case, and at least one resonance-absorbing element which connects said engine unit support to said crankcase and said flywheel case, and a noise-suppressing encapsulation secured to the crankcase and the flywheel case and encasing said engine parts which are directly affected by body resonance and sound vibration, wherein an exhaust pipe and an inlet pipe penetrate said encapsulation without touching it and are connected to the cylinderhead by means of vibration-insulating couplings, the parts of the exhaust pipe and the inlet pipe located outside the encapsulation each being supported by supporting means which is secured to the crankcase freed from vibration by said resonance-absorbing element.

4,183,345

ARCHER'S BOW WITH INTERMEDIATELY PIVOTED LIMBS

Joseph M. Caldwell, 2259 W. Big Tujunga Canyon, Tujunga, Calif. 91042

Filed Aug. 1, 1977, Ser. No. 820,636
Int. Cl.[2] F41B *5/00*
U.S. Cl. 124—24 R **39 Claims**



1. A shooting bow comprising

a rigid elongate handle riser assembly having opposite ends and a central handle portion,

an elongate resilient limb at one of the ends of said assembly, the limb being resilient over a substantial portion of its length and defining an outer limb tip at one of the opposite ends of the bow at one of the opposite ends of the limb,

a bowstring coupled between the outer limb tip and the other end of the bow adjacent a rear face of the assembly, the bowstring having a nocking point adapted to be drawn from a rest position to a drawn, limb-flexing position upon application of drawing force thereto,

mounting means connecting, (a) the limb at a location intermediate that portion of the limb's length which is resilient to, (b) the respective end of said assembly for hinging motion of the limb relative to the assembly as the bowstring is drawn and about an axis substantially perpendicular to the plane in which the bowstring moves in being drawn from its rest to its drawn position, the limb having an inner tip adjacent a front face of the assembly proximate the handle,

and tether means connected between the limb inner tip and the assembly for constraining the inner tip from movement linearly relative to the assembly in response to application of drawing force to the bowstring during which the limb experiences substantial flexing at locations therealong on opposite sides of said location of connection of the limb to the riser assembly for storage of substantial energy in the limb on opposite sides of said location.

4,183,346

ARCHERY BOW IN COMBINATION WITH AN ADJUSTABLE DRAW CHECK

Fernando V. Troncoso, Jr., 1851 S. Orange Ave., Monterey Park, Calif. 91754

Filed Nov. 3, 1977, Ser. No. 848,146
Int. Cl.[2] F41B *5/00*
U.S. Cl. 124—24 R **5 Claims**

1. An archery bow and draw check comprising in combination:

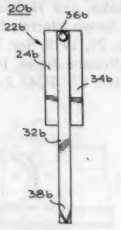
a. an archery bow having an arrow rest; and,

b. an improved archery arrow draw check comprising, in combination

i. a support,

ii. means attaching one side of said support to said archery bow adjacent said arrow rest, and

iii. a resilient arm secured to and biased towards the opposite side of said support, said arm including means adapted to contact the outer margin of an arrow when the arrow is on said rest, said means having a segment projecting toward said support and a trailing edge rearward of said segment, said segment having a rearwardly



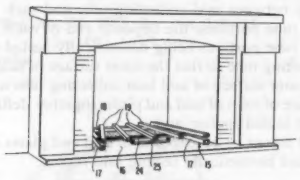
sloped rear portion spaced from said trailing edge, whereby when an arrow is on said rest between said arm and said support, and when the point of said arrow is drawn down said sloped portion said means moves toward said support to provide a first signal, and when said point is subsequently drawn back further to a point past said trailing edge, said means again moves toward and contacts said support to provide a second separate signal spaced in time from said first signal.

4,183,347

AIR HEATING AND CIRCULATING FIREPLACE GRATE

Paul S. Newswanger, 1401 Vermont Ave., Lancaster, Pa. 17603

Filed Sep. 16, 1977, Ser. No. 833,828
Int. Cl.[2] F24B *7/04*
U.S. Cl. 126—121 **10 Claims**



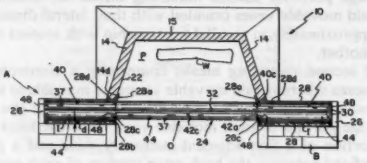
1. An air heating and circulating fireplace grate comprising a tubular base frame adapted to rest on a fireplace floor and including a transversely extending rear section and side sections connected thereto in fluid communication and extending forwardly therefrom, and adapted to be respectively arranged adjacent to the rear and side walls of a fireplace and to be in contact with coals from a fire while in use, said rear sections and side sections having lower surfaces adapted for placement immediately adjacent a fireplace floor substantially throughout the lengths thereof, at least one side section of the tubular base frame being forwardly open, a plurality of front-to-back tubular grate bars having rear end portions secured to said rear section with the interiors of the grate bars and rear section in fluid communication, a raised support member for the tubular grate bars near their forward ends and being secured to said side sections of the tubular base frame at a distance above the lower surfaces thereof, said raised support member supporting the tubular grate bars in an upward inclination forwardly and defining a front ash removal opening for the space beneath said tubular grate bars and bounded by said tubular base frame, and the forward ends of the tubular grate bars being open for delivering heated air to a room from a fireplace in which the grate is being utilized.

4,183,348

FIREPLACE FRONT

Joseph O. Smith, 4419 W. Kings Corner, Glennie, Mich. 48737

Filed Sep. 29, 1977, Ser. No. 837,695
Int. Cl.[2] F24C *15/10*
U.S. Cl. 126—140 **18 Claims**



1. Apparatus for closing the front opening of a fireplace heat chamber comprising:

a frame adapted to be mounted on the front of said heat chamber including

upper and lower, generally parallel, longitudinally extending sets of front and rear tracks;

closure walls spanning said upper and lower tracks on opposite ends of a central opening adapted to be aligned with said front opening, and defining enclosed door receiving pockets on opposite ends of said central opening, said closure walls including front and rear walls spanning the upper ends of the front and rear sides of said tracks, at least said front wall being expansible when heated;

a pair of generally co-planar, perforate doors mounted on one of said front and rear sets of tracks for sliding movement between abutting positions closing said central opening and spread positions received in said pockets at opposite ends of said central opening;

a pair of generally co-planar, generally imperforate doors mounted on the other of said front and rear sets of tracks for sliding movement between abutting positions covering said central opening and spread positions received in said pockets at opposite ends of said central opening; and

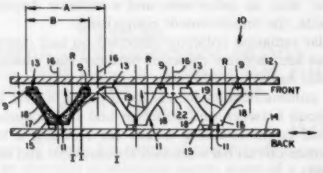
expansion wall spacer means on at least said front wall defining expansion cavities alongside said front wall for receiving a portion of said front wall when said front wall is heated and expands.

4,183,349

THERMAL INDUCTION UNIT

John S. Frye, 3098 Trafalgar Way, Chamblee, Ga. 30341

Filed Nov. 25, 1977, Ser. No. 854,727
Int. Cl.[2] F24J *3/02*; F28F *27/00*
U.S. Cl. 126—439 **9 Claims**



1. Apparatus for controlling the transfer of heat between adjacent regions of differing temperatures comprising:

a series of approximately flat rectilinear stationary vanes arranged with their longitudinal dimensions parallel to

one another and in a common plane, each stationary vane including two reflective side surfaces and front and back edge portions, first mounting means for maintaining said stationary vanes oriented with their lateral dimensions approximately in parallel relationship with respect to one another,

a series of approximately flat rectilinear movable vanes arranged with their longitudinal dimensions parallel to one another and in a common plane, each movable vane including two reflective side surfaces and front and back edge portions, second mounting means for maintaining said movable vanes oriented with their lateral dimensions approximately in parallel relationship with respect to one another,

said second mounting means comprising a common rack means whereby said movable vanes are movable in unison back and forth from a first position, in which the front edge portion of each movable vane abuts the front edge portion of a first adjacent stationary vane and a gap is defined between the back edge portion of each movable vane and the back edge portion of a second adjacent stationary vane to a second position in which the back edge portion of each movable vane abuts the back edge portion of said second adjacent stationary vane and a gap is defined between the front edge portion of each movable vane and the front edge portion of said first adjacent stationary vane.

4,183,350

PREFABRICATED OUTER WALL ELEMENT

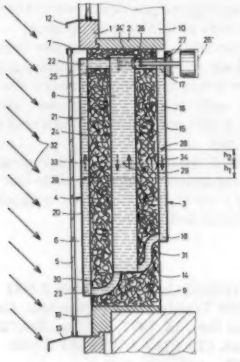
Werner Staudacher, Bantigerstrassse 19a, Zollikofen, Switzerland

Filed May 12, 1977, Ser. No. 796,147

Claims priority, application Switzerland, May 20, 1976, 6372/76

Int. Cl.[2] **F24J** *3/02*

U.S. Cl. 126—430 **3 Claims**



1. In a prefabricated outer wall element of the type having an inner side, an outer side, and a radiator disposed on said inner side, the improvement comprising:

a solar radiation collector disposed on said outer side,

a heat accumulator disposed between said radiator and said solar radiation collector,

first communicating means for forming a first heat carrier circuit between said collector and said accumulator,

second communicating means for forming a second heat carrier circuit between said accumulator and said radiator, and

a filling tube for introducing a heat carrier into said heat accumulator, said solar radiation collector, and said radiator, said filling tube being so disposed with respect to said heat accumulator that said heat accumulator cannot be completely filled with said heat carrier, whereby an unfilled space is left in said heat accumulator to serve as expansion space,

the height of said radiator being less than the height of said heat accumulator and the height of said accumulator being less than the height of said solar radiation collector.

4,183,351

SOLAR HEAT COLLECTING APPARATUS

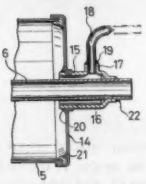
Katsuhiro Hinotani, Shijyonawate; Keiichi Kanatani, Hirakata; Masato Osumi, Osaka, and Hajime Hayama, Nara, all of Japan, assignors to Sanyo Electric Co. Ltd., Osaka, Japan

Filed Jan. 27, 1978, Ser. No. 872,997

Claims priority, application Japan, Feb. 8, 1977, 52/15257[U]

Int. Cl.[2] **F24J** *3/02*

U.S. Cl. 126—443 **11 Claims**



1. A solar heat collecting apparatus comprising:

an outer transparent tube having at least one open end;

a heat collecting tube having a passage therethrough disposed within said outer tube;

an end plate at each of said at least one open ends having a support tube portion affixed at one of its ends to an end plate member portion,

each of said end plate member portions arranged transverse to said outer tube, the periphery of each of said end plate member portions hermetically sealed to said outer tube,

the inner diameter of each of said support tube portions being sufficiently larger than the outer diameter of said heat collecting tube so that when said collecting tube is disposed within each of said support tube portions a gap exists between said collecting tube and each of said support tube portions, the opposite end of each of said support tube portions being hermetically sealed to said heat collecting tube so that the inner surface of said outer tube, the outer surface of said heat collecting tube and the inner surface of each of said end plates together define a hermetically sealed region; and

exhaust means on at least one of said end plates for exhausting and hermetically sealing said region.

4,183,352

PRESSURE-ISOLATING CIRCULATING PUMP FOR SOLAR WATER HEATING

Hugh J. Spencer, 267 Cordeaux Rd., Mt. Kembla 2500, Australia

Filed Oct. 12, 1977, Ser. No. 841,337

Int. Cl.[2] **F24J** *3/02;* **F04C** *1/00, 11/00, 13/00*

U.S. Cl. 126—432 **4 Claims**

1. A metering pump for circulating water continuously between a hot water tank containing water at a substantially high mains pressure and a panel-like solar heat collector made of thin material and unable to withstand said mains pressure containing the same liquid at a low pressure, comprising:

four external liquid connections to said tank and collector leading into pump chambers,

drive means driving piston means movable in said chambers to move said liquid by positive displacement between said tank and collector,

said connections including a high-pressure inlet and outlet connectable to said tank and a low-pressure inlet and outlet connectable to said collector, and

metering control means to effect the following cycle of operation:

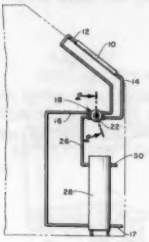
(a) admit a predetermined volume of said liquid from said high-pressure inlet to a pump chamber,

(b) isolate said volume from all said connections,

(c) transfer said volume from said chamber to said low-pressure outlet, and

(d) admit a like predetermined volume of said liquid from said low-pressure inlet to a pump chamber,

(e) isolate said like volume from all said connections, and



(f) transfer said like volume to said high-pressure outlet;

forces exerted on said piston means by said liquid at said high pressure during said steps (a)–(c) being balanced by said forces during said steps (d)–(f) to exchange substantially no mechanical energy with said drive means,

said pump isolating said collector from said high pressure while circulating said water between said collector and tank, and

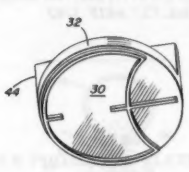
said drive means requiring only enough external power to overcome viscous and mechanical friction.

4,183,353

METHOD AND POSITION MARKER FOR THE DETECTION OF DEEP VEIN THROMBOSIS

Thomas M. Gallub, Walton, Ky., assignor to Actus, Inc., Florence, Ky.

Filed Jun. 26, 1978, Ser. No. 919,218
Int. Cl.[2] A61B *6/00*
U.S. Cl. 128—654 **6 Claims**



1. A position marker for use in mapping a series of readings in a deep vein thrombosis detection scan by means of a detector having a probe containing a detector crystal with an effective detection area less than the area of the face of the probe head, the position marker comprising:

a substantially planar face having a marking pattern thereon for scribing markings on an area to be scanned;

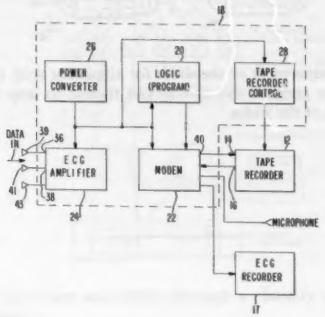
said marking pattern being in the format of a crescent defined by a first circle having a diameter slightly greater than the outside diameter of the detector probe face, and an overlapping second circle intersecting said first circle, said second circle having a diameter equal to that of said first circle, and the spacing between centers of said first and second circles being equal to or less than the effective diameter of the detector crystal.

4,183,354

AMBULATORY ELECTROCARDIOGRAPHIC RECORDER

Alfred E. Sibley, Cupertino; Travis W. Winsor, Los Angeles, and George F. Kinghorn, Saratoga, all of Calif., assignors to Cardiodyne, Inc., Cupertino, Calif.

Filed Jul. 18, 1977, Ser. No. 816,403
Int. Cl.[2] A61B *5/04*
U.S. Cl. 128—711 **1 Claim**



1. A monitoring system for handling data representing cardiac activity comprising: sensing means including a number of electrodes for attachment to a human body to sense cardiac activity thereof and to provide data signals representing such activity; a portable recorder adapted to be carried on the person and having a recording medium for receiving and recording data signals when the recorder is actuated; a program module for interfacing the signals representing cardiac activity provided by the sensing means, said program module having a microphone input terminal and a manually actuated switch to enable the microphone input, said program module further including an amplifier for receiving and amplifying the data signals, a modulator for generating a carrier signal and modulating the carrier signal with the input data signals, means for applying the modulated signal to the recorder unit, a demodulator having a output terminal, and means coupling the demodulator to the recorder to permit demodulated signals to be applied to the output terminal for application to the input of an ECG recorder, there being first means coupled with the recorder for automatically actuating the same at the end of each of a sequence of time intervals and for keeping the recorder in an actuated state for a predetermined data sampling period each time it is actuated, said first means including means for changing the frequency of the time intervals and duration of the sampling periods; and second means including a manually actuated switch for actuating the recorder during any of said time intervals to permit recording of abnormal cardiac activity during such time interval, whereby data signals provided by the sensing means can be recorded on said medium for subsequent playback to permit the evaluation of the quality of the cardiac activity represented by the data signals.

4,183,355

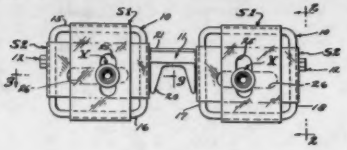
EYE MEDICATION DISPENSING FRAMES

Milton Meckler, 16348 Tupper St., Sepulveda, Calif. 91343

Filed Feb. 2, 1978, Ser. No. 874,409
Int. Cl.[2] A61M *1/00*
U.S. Cl. 128—233 **13 Claims**

1. A therapeutic frame for administering liquids by gravity from a dropper therefor to selective target areas of a person's eye, and including; a frame comprised of a nose bridge carrying spaced rims for disposition over each eye of the person, each of said rims having two right angularly spaced and parallel pairs of rails, two interfacially engaged slides carried over each of said right angularly spaced pairs of rails respectively

and each having a transverse slot and one normally related to the other, and a guide-adjustment-lock means engaged through each of the two interfacially engaged slides to guide the drop-



per after adjustment of the slides for alignment with a target area of the person's eye and locked thereat to stop further movement of the slides.

4,183,356

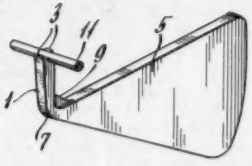
OPHTHALMIC APPLICATOR DEVICE

Neil W. Miller, Pennsburg, Pa., assignor to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 583,934, Jun. 5, 1975, abandoned. This application Mar. 7, 1977, Ser. No. 775,237

Int. Cl.[2] A61M *31/00*

U.S. Cl. 128—264 **5 Claims**



1. An ophthalmic applicator device for mechanically inserting solid medicaments, in the form of an ophthalmic insert, behind the upper or lower eye lid and into the upper or lower cul-de-sac of the eye consisting of:

an elongated handle portion having a major axis and a tip portion;

said tip portion having only one elongated tip of non-toxic, pliable material, said tip terminating in a single groove through an end of said tip sufficient to form two flexible, opposed termini of said tip adapted to releasably grip an insert by frictional engagement thereof between said termini, one of said termini being located at a distance further from the handle than the other of said termini;

said groove having cross-sectional conformation and dimensions of a size and shape sufficient to releasably grip an ophthalmic insert, and at least one dimension sufficiently less than the greatest dimension of an ophthalmic insert to result in removal of an ophthalmic insert from the ophthalmic applicator device by contact of an ophthalmic insert with the cul-de-sac of the eye; and

said handle portion attached to said tip portion at the end of said tip portion opposite said termini, and forming an interior angle between the axis of said elongated tip and the major axis of the elongated handle therewith of from about 30° to about 120°.

4,183,357

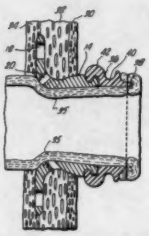
CHRONIC TRANSCUTANEOUS IMPLANT ASSEMBLY FOR ENTEROSTOMIES

Donald J. Bentley, Newport Beach, and James A. Benson, Tustin, both of Calif., assignors to Bentley Laboratories, Inc., Irvine, Calif.

Continuation of Ser. No. 710,638, Aug. 2, 1976, abandoned, which is a continuation-in-part of Ser. No. 525,832, Nov. 21, 1974, abandoned, which is a continuation-in-part of Ser. No. 338,051, Mar. 1, 1973, abandoned. This application Jul. 3, 1978, Ser. No. 921,707

Int. Cl.[2] A61F *5/44*

U.S. Cl. 128—283 **4 Claims**



1. A chronic transcutaneous substantially non-absorbing, impermeable, biocompatible and non-biodegradable implant device comprising:

a barrel member open at each end, said barrel member being further defined as including at least one annular groove at one end thereof;

a flange member extending from and secured to the exterior of said barrel member, said flange member including a plurality of apertures; and

a suture ring attached about said barrel member annular groove and extending longitudinally from said barrel member.

4,183,358

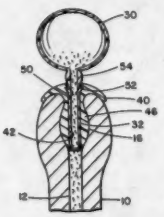
MALE CONTRACEPTIVE DEVICE

Milton J. Cohen, 9201 Persimmon Tree Rd., Potomac, Md. 20854

Filed Aug. 17, 1977, Ser. No. 825,239

Int. Cl.[2] A61F *5/42*

U.S. Cl. 128—294 **6 Claims**



1. A male contraceptive device comprising:

(a) a urethral sealing member in the form of an elongate hollow tube adapted to be received in a urethra and communicating with the urethra, said tube having, adjacent one end thereof, means to engage the fossa navicularis, said means including a flexible convex annular portion adapted to be displaced outwardly to engage the fossa navicularis in a sealing relationship, and

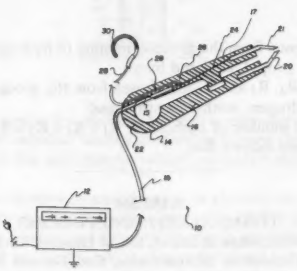
(b) container means mounted on said tube adapted to receive sperm passing from the urethra, said container means

being mounted on a threaded member and the interior of said tube defining threads adapted to receive said threaded member whereby the threadable tubular member with said tube serves to expand the flexible convex portion of said tube to effect a sealing relationship between said tube and the fossa navicularis.

4,183,359
EPILATOR

Harmon G. Husbands, Dallas, Tex., assignor to Electro-Kinetic Eng./Mfg., Inc., Richardson, Tex.

Filed Jan. 20, 1978, Ser. No. 870,864
Int. Cl.[2] A61N *3/04*
U.S. Cl. 128—303.13 **4 Claims**



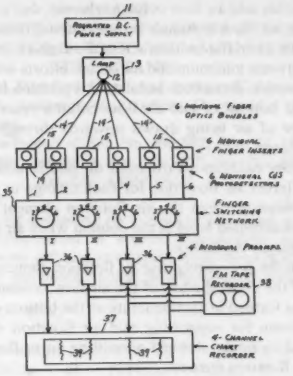
1. In an epilator system of the type having a shielded transmission line connecting a radio frequency source to a conductive gripping means, the improvement comprising a ground lead connected to the transmission line shield near the gripping means, and a grounding means for connecting said ground lead to a ground during operation of the system, wherein said grounding means is adapted for connection to the body of an operator of the system during said operation.

4,183,360
MULTIFINGER PHOTOCELL PLETHYSMOGRAPHY SYSTEM

Walter Carlson; Donald Wasserman, both of Cincinnati, and William Asburry, Bethel, all of Ohio, assignors to The United States of America as represented by the Department of Health, Education and Welfare, Washington, D.C.

Filed Jul. 26, 1978, Ser. No. 928,155
Int. Cl.[2] A61B *5/02*
U.S. Cl. 128—666 **15 Claims**

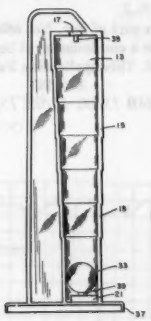
1. A multifinger blood flow measuring and recording instrument comprising a support, a plurality of open-ended finger-receiving housings mounted on said support and arranged to simultaneously individually receive all the fingers of a patient's hand, an electrical photodetector mounted in each housing, light pipe means connected to each housing opposite each photodetector and spaced therefrom to permit a finger to be inserted therebetween, a common light source optically coupled to the respective light pipe means, multichannel signal recording means, and circuit means connecting the photodetectors to the inputs of said multichannel recording means for simultaneously recording in respective channels the transmission of light from said source through a plurality of the patient's fingers.



4,183,361
RESPIRATORY EXERCISING DEVICE

Ronald D. Russo, 111 S. Barranca St., Apt. 327, West Covina, Calif. 91791

Filed Feb. 27, 1978, Ser. No. 881,672
Int. Cl.[2] A63B *23/00*
U.S. Cl. 128—725 **6 Claims**



1. An improved self-supporting respiratory exercising device comprising

a structure having a continuous generally vertically disposed air flow column formed therein, said column having a cross-sectional dimension which increases in size in graduated increments over the length of said air flow column and being larger at its top end than at its bottom end, said air flow column including

an air outlet at its top end, with a cross-sectional dimension between ¼th and ¾ths the cross-sectional dimension of the top end of the air flow column, and

an air intake slot at the bottom end thereof whereby air can be drawn upwards through said column,

an air duct formed in said structure adjacent said air flow column with a bottom outlet and the upper end of said duct arranged in pneumatic communication with the top end of the air flow column,

means attached to the bottom outlet of the air duct for withdrawal of air therefrom through said column,

an air flotation element movably disposed in said air flow

column and formed to be raised within said column by inhalation of air through said device by an operator, said air flotation element being sized to fit relatively closely within said air flow column wherein, due to the increase in the air flow column's cross-sectional dimension at intervals over the column's length, a given inhalation effort between minimum and maximum efforts will cause said air flotation element to stabilize at a position between the top and bottom of said air flow column relative to the flow rate of air being drawn upwards through said air flow column,

air flow calibrations disposed on said structure to indicate different air flow rate for each change in cross-sectional dimension when the air flotation element stabilizes at a precalibrated level in the column when air is being drawn through the device,

means for preventing said air flotation element from closing off the air at the top of the air flow column, and

means formed in said structure at the bottom of the air flow column for supporting said air flotation element above said air intake slot and permitting air to flow around said air flotation element.

4,183,362

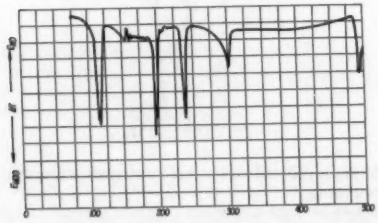
DECREASING THE BURN RATE OF SMOKING TOBACCOS

Vello Norman, Raleigh; Henry Moore, Durham, and Thomas B. Williams, Durham, all of N.C., assignors to Liggett Group Inc., Montvale, N.J.

Continuation-in-part of Ser. No. 680,637, Apr. 22, 1976, abandoned, which is a continuation of Ser. No. 501,763, Aug. 29, 1974, abandoned. This application Feb. 13, 1978, Ser. No. 877,583

Int. Cl.[2] A24B *15/00, 15/02, 15/04;* **A24D** *1/00*

U.S. Cl. 131—9 **15 Claims**



1. A smoking tobacco composition consisting essentially of a blend of natural cigarette smoking tobaccos, said blend containing from about 15 percent to a maximum of 30 percent by weight of a tobacco selected from the group of reconstituted and burley tobaccos, wherein said reconstituted and burley tobaccos are the fastest burning component of the blend said fast burning tobacco having deposited thereon a salt, which when heated from ambient to burning temperature exhibits a plurality of endothermic reactions at successively increasing temperatures in the range of from 100° C. to 500° C., selected from the group consisting of $MgCl_2.6H_2O$, $FeNH_4Cit$, $FeCl_3.6H_2O$, $Fe(SO_4).9H_2O$, $MgHCit$, $Na_3Cit.2H_2O$, and $KAL(SO_4)_2.12H_2O$ said salt being deposited on said fast burning tobacco in an amount of from about 0.1 percent to about 5.0 percent by weight of the combined anhydrous weight of said tobacco blend and said salt.

4,183,363

TOBACCO COMPOSITIONS FLAVORED WITH 2-HYDROXYMETHYLENECYCLOHEXANONES

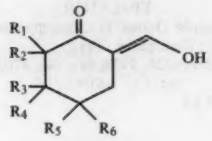
Cormack Flynn, Ramsey; Glen R. Fredericks, Clifton, and Alan R. Hochstetler, Franklin Lakes, all of N.J., assignors to Givaudan Corporation, Clifton, N.J.

Filed Jul. 25, 1978, Ser. No. 927,800

Int. Cl.[2] A24B *3/12*

U.S. Cl. 131—17 R **22 Claims**

1. A method for improving, enhancing or modifying the organoleptic properties of a tobacco product which comprises adding thereto an effective amount of a 2-hydroxymethylenecyclohexanone of the formula:



wherein:

R_1 is chosen from the group consisting of hydrogen, methyl, ethyl, propyl, allyl and butyl;

R_2, R_3, R_4, R_5 and R_6 are chosen from the group consisting of hydrogen, methyl or ethyl; and

the total number of carbons in $R_1+R_2+R_3+R_4+R_5+R_6$ does not exceed five.

4,183,364

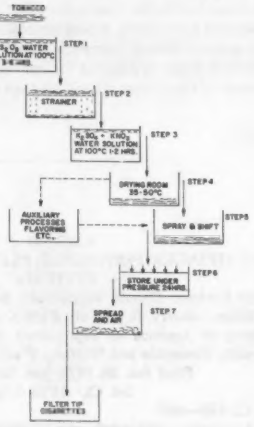
TOBACCO REFINING PROCESS

Osman H. Gumushan, deceased, late of Istanbul, Turkey, and by Hatice Gumushan, administrator, Cad Garanti Han Kat 8 Daire 31, Harbiye Halaskargi, Turkey

Filed Dec. 7, 1976, Ser. No. 749,959

Int. Cl.[2] A24B *15/02*

U.S. Cl. 131—143 **3 Claims**



1. A refining process for eliminating tars and nicotine from tobacco comprising the steps of:

a. steeping fresh shredded tobacco in a hot dilute aqueous bath of 0.1% to 0.3% Potassium Metabisulfite solution ($K_2S_2O_5$) for a period of three to six hours and subquently extracting the solution from the tobacco,

b. immersing the tobacco in a boiling aqueous solution of one to three percent gram ratio of Potassium Sulfate (K_2SO_4) and one to three percent gram ratio of Potassium Nitrate

(KNO_3) for a period of one to three hours and subquently extracting the solution from the tobacco,

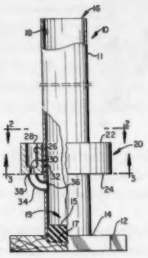
c. drying the tobacco under a temperature ranging from thirty-five to fifty degrees centigrade.

4,183,365

WATER PIPE OR BONG

Scott A. Kelley, P.O. Box 7181, Odessa, Tex. 79760

Filed Sep. 26, 1977, Ser. No. 836,424
Int. Cl.[2] A24F *1/26, 1/30*
U.S. C 131—180 **7 Claims**



1. An apparatus for smoking tobacco comprising:

an upright member having a chamber formed therewithin, an outlet for said chamber which can be covered by one's mouth;

a revolver member, means forming an aperture through said revolver member through which a marginal length of said upright member can be received, means rotatably supporting said revolver member about a marginal length of said upright member;

means forming a plurality of radially spaced-apart combustion chambers in said revolver member within which tobacco can be placed, means forming an inlet and an outlet for each said combustion chamber, means forming a flow passageway which extends from said outlet of said combustion chamber into communication with the interior of said chamber of said upright member; said revolver, when rotated, sequentially indexes the outlet of a combustion chamber with said flow passageway;

whereby tobacco can be placed within the combustion chambers, the outlet of one of the chambers indexed with said flow passageway, the tobacco within the indexed chamber ignited, one's mouth placed on the outlet for said chamber of said upright member to thereby force smoke to flow from the combustion chamber containing the burning tobacco, through the flow passageway, into the chamber of the upright member, and into one's mouth;

and thereafter the revolver can be rotated to bring another of the tobacco filled combustion chambers into indexed relationship respective to the flow passageway, so that tobacco in the last said another of said combustion chambers can be ignited and smoked.

4,183,366

HENNA HAIR COLORING AND/OR CONDITIONING COMPOSITIONS

William R. Bartuska, and Paul Silverman, both of Skokie, Ill., assignors to Helene Curtis Industries, Inc., Chicago, Ill.

Filed Oct. 19, 1977, Ser. No. 843,581
Int. Cl.[2] A45D *7/00*
U.S. Cl. 132—7 **14 Claims**

1. An improved henna composition comprising from about 75 to about 95 weight percent of henna powder, from about 1.5 to about 5 weight percent of a non-ionic surface active agent, from about 2.5 to about 15 weight percent of a water soluble polymer and from about 0.5 to about 5 weight percent of a quaternary salt.

4,183,367

ENHANCING THE DRYING OF HAIR BY THE USE OF FLUORINATED CATONIC AND AMPHOTERIC SURFACTANTS

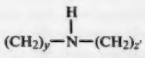
James C. Goebel, Stamford, Conn., and Anthony C. Lunn, Pleasantville, N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 693,582, Jun. 17, 1976, abandoned. This application Nov. 21, 1977, Ser. No. 853,712
Int. Cl.[2] A45D *19/16*
U.S. Cl. 132—7 **4 Claims**

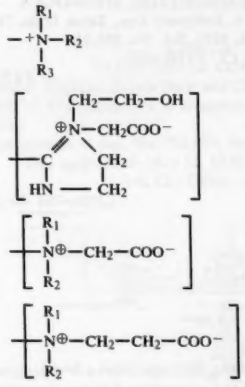
1. A method for enhancing the drying of hair when water or an aqueous composition is applied, comprising applying thereto an aqueous solution containing from about 0.05 to 5% of a cationic or amphoteric compound having the formula:

$$(C_nF_{2n+1})-R-Q$$

wherein n is an integer from 4 to 18, R is selected from the group consisting of $(CH_2)_x$, $(CH_2)_y-O-(CH_2)_z$, $(CH_2)_y-S-(CH_2)_z$,



wherein x is an integer from 1 to 6, the terminal $(CH_2)_y$ group is attached to the (C_nF_{2+1}) portion of the molecule, the terminal $(CH_2)_z$ group is attached to the Q portion of the molecule, y is an integer from 0 to 3, z is an integer from 1 to 3 and Q is selected from the group consisting of:



4,183,368

EAVE TROUGH FLUSHING SYSTEM

Gary V. Husted, 835 E. Main St., East Aurora, N.Y. 14052

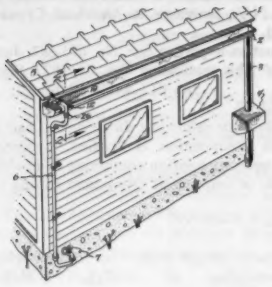
Filed Jun. 30, 1978, Ser. No. 921,058
Int. Cl.[2] B08B *3/02, 9/00*
U.S. Cl. 134—166 R **15 Claims**

1. An apparatus for causing cleaning fluid to be forceably injected into and lengthwise along an eave trough of a building, said apparatus adapted to be mounted on an eave trough having one of a plurality of standard widths and characterized by including:

a. a nozzle for forceably directing cleaning fluid; and

b. a nozzle mounting bracket including first and second portions telescopically adjustable relative to one another for laterally spanning said eave trough and means for

firmly clamping said first and second portions together in an adjusted configuration consistant with the width of said eave trough, said first portion including an inverted U profile end adapted to extend over and partially down the back of said eave trough, said second portion including a body with a fluid conduit having a first end adapted to mate with said nozzle and a second end adapted to be



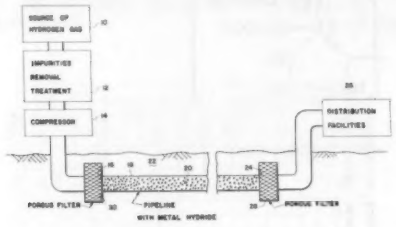
connected to a fluid source, said conduit having the form of and inverted U so as to be self-draining, said second portion further including a vertically downwardly extending member and an inwardly extending member adapted to fit under the outer overhanging contour of said eave trough to prevent vertical movement of said bracket when engaged with said eave trough.

4,183,369

METHOD OF TRANSMITTING HYDROGEN

Robert E. Thomas, 1800 S. Baltimore Ave., Tulsa, Okla. 74119

Filed Nov. 4, 1977, Ser. No. 848,614
Int. Cl.[2] F17D *1/02*
U.S. Cl. 137—13 **4 Claims**



1. A method of transmitting hydrogen from a first geographical point to a remote second geographical point, comprising:

purifying hydrogen gas to remove deleterious amounts of oxygen, carbon dioxide, and other contaminates;

adjusting the temperature and pressure of the purified hydrogen gas to preselected levels;

introducing the hydrogen gas into the inlet of a pipeline at a first geographical point, the pipeline being at least partially filled with activated metallic hydride wherein at least a portion of the hydrogen gas is absorbed by the hydride, and at least a portion of the hydrogen migrates from the inlet to the outlet of the pipeline by means of metallic hydride, the outlet of the pipeline being at a second, remote geographical location; and

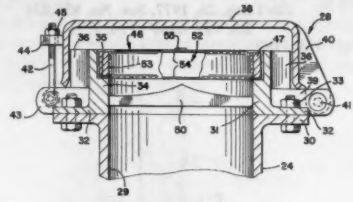
withdrawing hydrogen gas from the pipeline outlet end, at the second, remote geographical location, at least a portion of the hydrogen gas withdrawn being desorbed from the metallic hydride.

4,183,370

PRESSURE RELIEF VALVE

Franklin P. Adler, Michigan City, Ind., assignor to Pullman Incorporated, Chicago, Ill.

Division of Ser. No. 706,650, Jul. 19, 1976, Pat. No. 4,119,112.
This application Sep. 1, 1978, Ser. No. 939,091
Int. Cl.[2] F16K *17/40*
U.S. Cl. 137—68 R **5 Claims**



1. A safety vent for a covered hopper car having a hopper and a pneumatic discharge mechanism adapted to be connected to a fluid pressure system for material unloading, comprising;

a tubular member having a tubular wall providing a passage therein, one portion thereof connected to and communicating with the interior of said hopper car,

said tubular wall having a second portion communicating with the atmosphere,

a valve member rupturable at a predetermined design pressure supported on said tubular member between said tubular portions to block fluid flow through said tubular member,

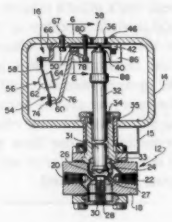
said valve member being a balloon-like element expanded within said member and including a stretchable diaphragm stretched transversely across said tubular wall which upon rupture of the said member torn portions of said diaphragm recede in a radially outward direction toward said tubular wall so as not to impede the fluid flow therethrough.

4,183,371

THERMAL VALVE

Richard S. Siawson, Barrington, R.I., assignor to G. W. Dahl Company, Inc., Bristol, R.I.

Filed Dec. 27, 1977, Ser. No. 865,016
Int. Cl.[2] F16K *17/38;* **A62C** *37/06*
U.S. Cl. 137—75 **19 Claims**



9. A thermal responsive valve comprising a valve body, a member within said body movable between a first or normal position and a second position, means normally urging said movable member towards said second position, restraining means at least partially mounted within an exterior housing associated with said body and including movable means and retaining means for said movable means engaged with said member so as to normally block movement thereof to said second position and thermally actuated means mounted inside of said housing normally maintaining said movable means in said blocking position, said thermally actuated means compris-

ing a fusible link, first means holding one end of said link, and second means holding the other end of said link, said first and second means cooperating so as to hold said link under tension, said second means comprising a rigid lever arm having a fulcrum portion, one end of said arm engaging said other end of said link, and means releasably holding the other end of said arm in spaced relation to said housing with said fulcrum portion engaging said retaining means and a portion of said member operatively engaging said movable means, said movable means independently movable by said member against frictional forces imparted thereto by the cooperation of said movable means with said retaining means, whereby when said link fuses due to the presence of a predetermined degree of heat, the tension exerted thereon causes said link to separate, thus releasing said tension means and permitting displacement of said retaining means and movable means so as to permit said urging means to move said one member to said second position.

4,183,372

ALTITUDE COMPENSATION VALVE ASSEMBLY

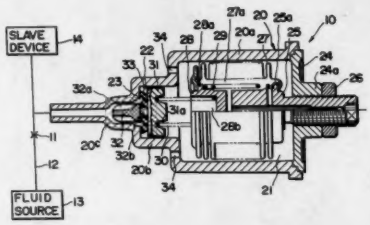
Tatehito Ueda, Susono; Minoru Yamanaka, Toyota, and Shoji Ito, Nagoya, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya and Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, both of, Japan

Filed Apr. 4, 1977, Ser. No. 784,513

Claims priority, application Japan, Apr. 5, 1976, 51-38551; Apr. 5, 1976, 51-38552

Int. Cl.[2] F02M *7/12*; F16K *17/36*

U.S. Cl. 137—81 **5 Claims**



1. A fluid-operated system including means for maintaining fluid pressure substantially constant during pressure changes in the ambient atmosphere, comprising:

(a) a source of fluid under pressure;

(b) a slave device operatively controlled by fluid being supplied from said fluid source;

(c) passage means for transmitting fluid from said fluid source to said slave device;

(d) a housing having a first chamber communicating with said passage means and a second chamber communicating with the atmosphere;

(e) a normally biased closed valve operatively supported in said housing between said first and second chambers for permitting communication between said first and second chambers as a function of the degree of opening of the valve;

(f) diaphragm means supported within said second chamber and responsive to changes in atmospheric pressure; and

(g) a compression spring disposed between said valve and said diaphragm means, the biasing force of said compression spring varying with the response of said diaphragm means to changing atmospheric pressure, said compression spring and diaphragm means cooperating to maintain a substantially constant closing force on said valve during changes in atmospheric pressure and maintaining a substantially constant fluid pressure in said passage means.

4,183,373

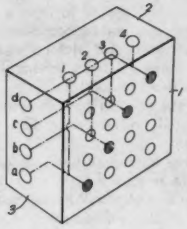
FLUID PRESSURE-OPERATED SYSTEMS

Francis X. Kay, The School House, Addington, Buckinghamshire, England

Filed Apr. 24, 1978, Ser. No. 899,154

Int. Cl.[2] F16K *11/00*

U.S. Cl. 137—269.5 **13 Claims**



1. For a fluid pressure-operated system, in interconnecting unit comprising

(a) a matrix block having primary and secondary sets of non-intersecting passages disposed in superposed relationship with each passage of each set extending transversely across all the passages of the other set;

(b) individual linking passages joining each passage of the primary set with every passage of the secondary set; and

(c) flow-controlling plug members adapted to be fitted to said linking passages selectively to control fluid flow between primary and secondary passages joined by the linking passage fitted with such a plug member.

4,183,374

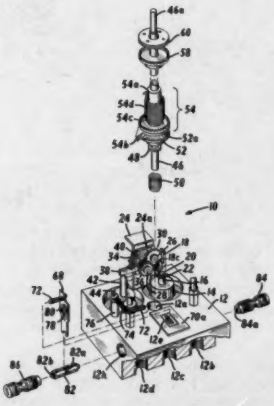
FLUID PULSE COUNTER

Ronald J. Malecki, Brown Deer, and Charles P. O'Neil, Cudahy, both of Wis., assignors to Amerace Corporation, New York, N.Y.

Continuation of Ser. No. 756,029, Dec. 29, 1976, abandoned. This application May 12, 1978, Ser. No. 905,462

Int. Cl.[2] G05B *19/44*

U.S. Cl. 137—624.2 **12 Claims**



1. Apparatus for providing an output signal of variably preselectable fluid pressure level upon receipt of input fluid pressure pulses in predetermined number, comprising:

(a) input transducer means having an inlet passage for re-

ceipt of said input pulses and a count actuator cyclically movable on receipt of each such pulse;

(b) accumulator means having a totalizing member engaged by said count actuator in the course of each such cyclic movement for counting said input pulses and an output element displaced incrementally from an initial position upon each such engagement of said count actuator with said totalizing member;

(c) said accumulator means further including latch means operable by latch input independent of the fluid pressure of said input pulses for latching said totalizing member upon each incremental displacement of said output element engageable therewith;

(d) count presetting means for displacing said output element into said initial position according with said predetermined number;

(e) output means having an input conduit in fluid pressure isolation with respect to said inlet passage and thereby pressurizable at such variably preselectable pressure level irrespective of the pressure level of said input pulses, an output conduit for furnishing said apparatus output signal, a valve operable to connect said input conduit with said output conduit and a valve operator disposed in the path of movement of said accumulator means output element and operating said valve on engagement of said operator with said accumulator means output element; and

(f) reset means coupled to said latch means for releasing said latch means from engagement with said totalizing member in response to reset fluid pressure input independent of said input pulses and for causing said output element to return to its initial position.

4,183,375

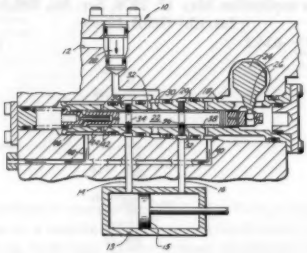
MULTI-PATH VALVE STRUCTURE HAVING EXTENDED LIFE

Ralph L. Vick, Granada Hills, Calif., assignor to The Bendix Corporation, North Hollywood, Calif.

Continuation of Ser. No. 697,891, Jun. 21, 1976, abandoned, which is a continuation of Ser. No. 528,177, Nov. 29, 1974, abandoned. This application Dec. 1, 1977, Ser. No. 856,380

Int. Cl.[2] **F15B** *13/04;* **F16K** *47/00*

U.S. Cl. 137—625.3 **14 Claims**



1. In a flow control valve wherein a spool valve member is movable within a sleeve to open and close fluid passageways in said valve, a rigid structure forming part of said sleeve for dividing the flow entering and leaving said passageways into a plurality of streams comprising a stack of laminar disks having abutting faces and internal edge surfaces adjacent lands of said spool member,

said stack of disks including a first flow path across said stack comprising a series of chambers connected to each other through a series of orifices whose pressure drops are limited to values which avoid erosion of said orifices while limiting erosion of the metering edges of said spool valve member, and a second flow path in parallel with said first flow path of large area compared with the areas of said orifices, said stack including a first group of disks at its outside edges each of which includes at least one opening at an internal edge surface thereof communicating with said first flow path and a second group of disks adjacent said first group having a pattern of openings in registry with openings in said first group plus other openings including at least one additional opening at an internal edge surface, at least some disks of said second group also including a large slot communicating with an internal edge opening, said slot providing at least part of said second flow path such that an initial movement of said valve member away from null over a portion of its travel less than approximately one-third its total travel causes flow to be directed through said first flow path and a further movement causes flow to be directed through said second flow path.

4,183,376

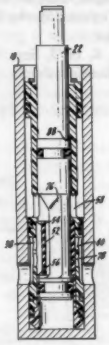
COLLAPSIBLE SLEEVE MIXING VALVE

Alfred M. Moen, Grafton, Ohio, assignor to Stanadyne, Inc., Windsor, Conn.

Continuation-in-part of Ser. No. 677,323, Apr. 15, 1976, abandoned. This application Sep. 28, 1977, Ser. No. 837,428

Int. Cl.[2] **F16K** *11/02, 7/07*

U.S. Cl. 137—625.17 **18 Claims**



7. In a fluid valve, generally cylindrical sleeve means having inlet means and an outlet, a valve control member mounted for reciprocal movement within said sleeve means to control the flow of fluid from the inlet means to the outlet, a flexible sleeve positioned within said sleeve means and in register with the termination of said inlet means between said inlet means and outlet, said outlet being axially beyond said flexible sleeve, means on said valve member within said flexible sleeve for controlling the passage of water from said inlet means to the outlet, and cooperating means on said valve member and flexible sleeve for forming a closure between said inlet means and outlet including a generally cylindrical portion on said valve member terminating at one end thereof in a circumferential shoulder, said shoulder being in contact with an annular portion of said flexible sleeve when said valve is in the closed position.

4,183,377

SINGLE HANDLE MIXING FAUCET

Georg Bernat, Menden, Fed. Rep. of Germany, assignor to ITT Industries, Inc., New York, N.Y.

Filed Dec. 19, 1977, Ser. No. 861,577

Claims priority, application Fed. Rep. of Germany, Dec. 22, 1976, 2658022

Int. Cl.[2] **F16K** *11/06*

U.S. Cl. 137—625.17 **4 Claims**

1. A mixing valve for mixing hot and cold water sources and providing an output thereof comprising:

a valve housing having a central bore having a longitudinal axis, first and second passageways and an outlet;

first and second inlets on said housing for respectively receiving said hot and cold water sources and said inlets communicating with said first and second passageways;

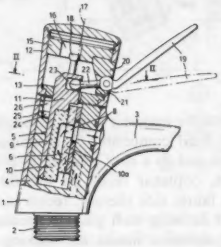
a head-piece casing mounted on said housing and rotatable about said longitudinal axis;

a first valve plate mounted within said bore having a surface parallel to said longitudinal axis and having first and second inlet bores communicating with said first and second passageways, respectively, and an outlet bore communicating with said outlet;

handle means pivotally connected to said head-piece;

a pusher plate supported in said central bore and movable parallel to said longitudinal axis;

a second valve plate carried by said pusher plate, said second valve plate having a surface positioned parallel to said longitudinal axis, said second valve plate surface having a



mixing passage and said second valve plate adapted to slideably engage said first valve plate surface to position said mixing passage in communication with said first and second inlet bores and said outlet bore;

first means connecting said pusher plate to said handle for translating a displacement of said handle in a direction substantially parallel to said longitudinal axis to a corresponding displacement of said second valve plate parallel to said longitudinal axis to regulate the volume of mixed water; and,

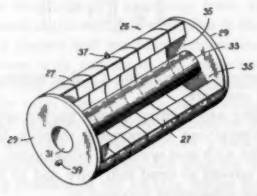
pivot means for translating a rotational displacement of said head-piece to a pivotal displacement of said pusher plate about an axis perpendicular to said longitudinal axis whereby said second valve plate regulates the mixture of hot and cold water, said pivot means including a slide guide in said head-piece and rotatable about said longitudinal axis, and a sliding pad connected to said pusher plate, said sliding pad being displaced from said longitudinal axis and adapted to cooperatively engage said slide guide.

4,183,378

LIGHT WEIGHT VACUUM MAINTAINED STRUCTURES

Bert J. Decker, 136 Capen Blvd., Buffalo, N.Y. 14226

Filed Dec. 21, 1976, Ser. No. 752,728
Int. Cl.[2] F16L *9/18, 9/22*
U.S. Cl. 138—149 **5 Claims**



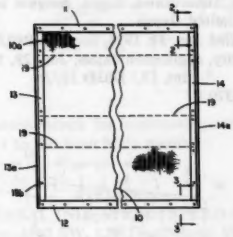
1. A light weight vacuum maintained hollow cylindrical structure comprising: a plurality of separate walled hollow members, the walls of said members being of thin, normally flexible material, which members are internally gas pressurized so as to have such gas apply forces against interiors of the walls thereof to press them outwardly and maintain the members in desired form, the members being positioned with respect to each other, with walls of adjacent hollow members being in contact with each other, to form a cylinder; means for sealing off the ends of the cylinder under an internal pressure which is less than an external pressure on the hollow cylindrical structure so that the separate walled hollow members are held together by the external pressure to help seal off the hollow interior of such structure; and gas in the interior of the cylindrical structure and gas external to such structure, with the pressure in the interior being less than atmospheric and that external to the structure being greater than that in the structure interior.

4,183,379

DUCT BOARD ASSEMBLY

Ralph L. Marquette, and James E. Jones, both of Indianapolis, Ind., assignors to Mutz Corp., Indianapolis, Ind.

Continuation of Ser. No. 637,292, Dec. 3, 1975, abandoned. This application Apr. 27, 1977, Ser. No. 791,509
Int. Cl.[2] F16L *59/14*
U.S. Cl. 138—158 **5 Claims**



1. An article of manufacture of substantially flat configuration from which a thermally-insulated air duct section is formed, comprising:

a sheet of thermally-insulating material, having an inside face, an outside face, a pair of longitudinal margins comprised of flexible fibers, and a pair of transverse margins:

flange means mounted at one of said longitudinal margins;

gripping means, mounted at the other one of said longitudinal margins, adapted to attachingly interconnect with said flange means upon bringing said longitudinal margins into compressed, abutting relationship so that said fibers comprising one of said longitudinal margins contact said fibers comprising the other one of said longitudinal margins continuously along the seam defined by the confluence of said longitudinal margins;

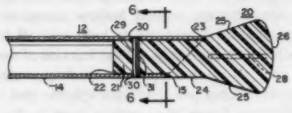
means defining a plurality of longitudinal grooves in the inside face of said article for folding said article to form said air duct sections; and

frame strips, mounted on the outside face of said article at said transverse margins, compising bendable portions and extending parallel with said grooves, and rigidifying portions interconnecting said bendable portions to rigidify said article, whereby a rigid, thermally-insulated air duct section is formed entirely from said article of manufacture as it exists in its substantially flat configuration.

4,183,380
LEASE RODS FOR TEXTILE APPARATUS

Frank H. Kaufmann, Greenville, S.C., assignor to Steel Heddle Manufacturing Company, Greenville, S.C.

Filed Jun. 26, 1978, Ser. No. 919,261
Int. Cl.[2] D03D *49/22*
U.S. Cl. 139—98 5 Claims

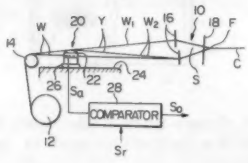


1. A lease rod comprising
an elongated metal tubular portion having a smooth exterior surface for engagement by a system of threads, and
a flattened end tip formed of plastic material carried by said tubular portion,
said tubular portion having an inclined end face disposed at an angle to the longitudinal axis of the tubular portion,
said end tip having
a stem extending into the tubular portion, and
a an inclined rim in abutting engagement with said end face of said tubular portion.

4,183,381
METHOD OF AND DEVICE FOR DETECTING AN IMPROPER PICK OF WEFT YARN IN A WEAVING LOOM

Miyuki Gotoh, Tokorozawa, Japan, assignor to Nissan Motor Company, Limited, Japan

Filed Jun. 27, 1978, Ser. No. 919,614
Claims priority, application Japan, Jun. 29, 1977, 52-76628
Int. Cl.[2] D03D *51/18*
U.S. Cl. 139—370.1 18 Claims

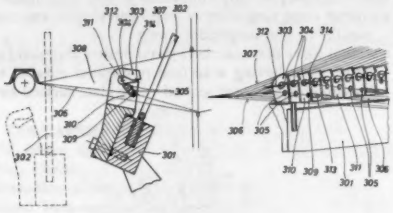


1. A method of detecting an improper pick of weft yarn in a weaving loom having a weft filling stage in which a pick of weft yarn is to be inserted into a weaving shed having a weft inserting end and beaten up onto the fell of a woven cloth during each cycle of operation of the loom, comprising detecting a total of tensions in a predetermined number of warp yarns, producing an electric tension signal representative of the warp yarn tensions detected during beating of the weft yarn in each cycle of operation of the loom, storing each of the tension signals for a predetermined number of consecutive cycles of operation subsequent to each of the cycles in which the tension signals are produced, producing a variable reference signal representative of the values respectively represented by a predetermined number of stored tension signals, comparing each of the tension signals with the reference signal which is produced during the cycle of operation prior to the cycle in which the tension signal to be compared with the reference signal is produced, and producing an output signal if and when the value represented by the tension signal compared with the reference signal is in a predetermined relationship to the value represented by the latter.

4,183,382
APPARATUS FOR WEFT INSERTION IN A WEAVING LOOM

Walter Scheffel, Hopfenstrasse 14, D 8832 Weissenburg, Fed. Rep. of Germany

Filed Feb. 28, 1977, Ser. No. 772,834
Claims priority, application Fed. Rep. of Germany, Feb. 27, 1976, 2608030; May 19, 1976, 2622148; Jun. 18, 1976, 2627391; Sep. 4, 1976, 2639998
Int. Cl.[2] D03D *47/30*
U.S. Cl. 139—435 23 Claims

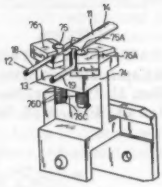


1. Apparatus for inserting a weft through the shed of a loom by means of fluid comprising in combination: a plurality of elements arranged in a row adapted to receive warp threads therebetween, coplanar reeds on the side of said elements opposite the fabric side thereof, recess means formed in said elements and defining weft passage means open on the reed side of said elements, means for rocking said elements and reeds in a circular arc and means for directing a fluid jet generally longitudinally of and in converging relation with said weft passage means in the picking direction to convey a weft along said passage means, at least a portion of said means for directing the fluid jet comprising aperture means formed in a channel of at least some of said elements, at least some of the elements at the downstream end of said jet including a notch to form a continuation of the channel for said jet.

4,183,383
WIRE SHAPING MECHANISM FOR PRODUCTION OF WIRE LEADS

Ragnar Gudmestad, West Allis, and Thomas J. Kratoska, Milwaukee, both of Wis., assignors to Artos Engineering Company, New Berlin, Wis.

Filed Sep. 25, 1978, Ser. No. 945,429
Int. Cl.[2] B21F *23/00*
U.S. Cl. 140—105 6 Claims



1. In apparatus for processing a cable segment which includes at least one wire:
a wire bending and holding device having relatively movable wire-receiving components thereon for releasable engagement with said wire, said components being operable when moved to bend said wire and to hold the bent wire during subsequent processing;
means for directing said wire into releasable engagement with said wire-receiving components of said device;
means for effecting relative movement of said components

while said wire is engaged thereby to effect bending of said wire;

and means for disengaging the bent wire from said components after said subsequent processing.

4,183,384

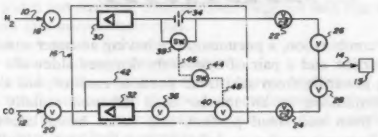
PROCESS AND APPARATUS FOR BLENDING FLUIDS TO MAINTAIN CONCENTRATION OF ONE BELOW A PREDETERMINED MAXIMUM

Eugene D. Ervin, Wescosville; Frederick K. Kitson, Kutztown; David M. Krasiewich, Allentown, and Thomas E. McWhorter, Whitehall, all of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Jan. 18, 1978, Ser. No. 870,553

Int. Cl.[2] B65B *3/04*

U.S. Cl. 14—19 **10 Claims**



1. A process for preventing the formation of a mixture of fluids in which the concentration of a first fluid is greater than a predetermined maximum, which process comprises blending a stream of the first fluid flowing at a predetermined rate with at least one inlet stream of another fluid flowing at a predetermined rate in order to form a combined stream in which the concentration of the first fluid is no greater than the predetermined maximum, sensing the flow rate of the first stream, sensing flow and the flow rate of each of the inlet streams, interrupting the flow of the first stream upon detection of an increase in the flow rate of the first stream and interrupting the flow of the first stream upon detection of a decrease in the flow rate or a no flow condition in any of the inlet streams.

4,183,385

HAND TOOL

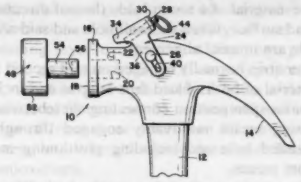
George L. Burkybile, 1205 S. 31 St., Muskogee, Okla. 74401

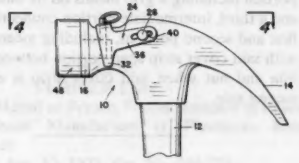
Filed Apr. 10, 1978, Ser. No. 894,527

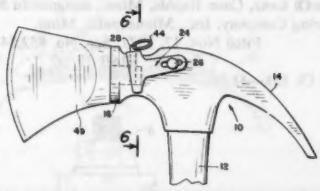
Int. Cl.[2] B25C *1/00*

U.S. Cl. 145—29 A **5 Claims**

1. A hand tool for selectively supporting interchangeable working elements and comprising a main body member having a longitudinally extending bore provided in one end thereof for selectively receiving a working element therein, a transversely extending bore provided in the main body and in communication with the longitudinally extending bore, locking means pivotally secured to the main body member in the proximity of the bored end thereof and movable between locking and unlocking positions with respect to the transversely extending bore for removably securing the working element in a working position on the main body member, said locking means comprising a yoke member pivotally secured to the main body member and spanning the width thereof, a locking pin carried by the yoke member and engageable with the transverse bore in the locking position of the locking means for securing the working element in the working position, and wherein the yoke member comprises a substantially inverted U-shaped bracket having the opposite legs thereof loosely disposed on the opposite sides of the main body portion in the locking position of the locking means, and flange means extending outwardly from each leg of the U-shaped bracket and having







elongated slot means therein for facilitating pivotally securing the yoke member to the main body member.

4,183,386

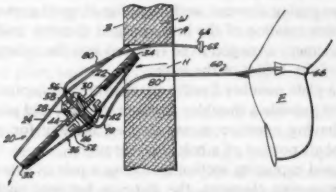
UNIVERSAL INDUSTRIAL SPEED NUT

Robert M. Brown, 6545 SW. 129 Ter., Miami, Fla. 33156

Filed Sep. 11, 1978, Ser. No. 940,961

Int. Cl.[2] F16B *35/04, 37/04*

U.S. Cl. 151—41.7 **10 Claims**



1. In combination, a threaded fastening means and a device for attaching the fastening means to a blind, normally inaccessible wall surface relative to a hole of a predetermined diameter, preformed through the wall from an accessible side thereof comprising

a nut sized and shaped for endwise passage through the wall hole and including a central internally screw threaded hole and at least two opposed outwardly extending projections sized to extend outwardly beyond the periphery of the wall hole when said screw threaded hole and wall hole are axially aligned,

a pair of tape lengths of the pressure sensitive type, provided

with adhesive material on both sides thereof, secured on first sides to the respective outwardly extending projections, outwardly of said threaded hole, and with the adhesive material of a second side thereof directed toward the blind surface, when the wall hole and said screw threaded hole are in axial alignment,

a cover strip normally engaged on said second side adhesive material of both of said tape lengths and including a continuous span portion connecting therebetween,

centering means removably engaged through said screw threaded hole and including positioning means and retainer means,

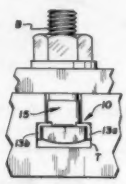
an elongated nut mounting means including a first inner portion of a predetermined length slidably engaged through an axial hole through said centering means and including an enlarged disc on its inner end, a second, outer portion including a grip means on its outer extended end, and a third, intermediate portion connecting between said first and second portions, including means in engagement with said cover strip span portion between said span portion and nut when said cover strip is engaged on said second side.

4,183,387

T-BOLT ADAPTER

John O. Lenz, Coon Rapids, Minn., assignor to Kurt Manufacturing Company, Inc., Minneapolis, Minn.

Filed Nov. 17, 1977, Ser. No. 852,541
Int. Cl.[2] F16B *39/00*
U.S. Cl. 151—41.76 **5 Claims**



1. A T-Bolt adapter device arranged and constructed to receive and retain the head of a bolt therein for placement of the same into the anchoring T-Slot of a machine tool table or the like, said adapter including:

a. a capturing section having at least one extending head engaging element, said engaging element preventing relative rotation of the bolt engaged thereby, said capturing element arranged to be received into the enlarged portion of the T-Slot of the table;

b. a plate member fixedly attached to said capturing section to provide a shoulder adjacent thereto, said plate member having aperture means defined thereby for passing the shaft portion of a bolt therethrough;

c. said capturing section including a pair of extending head engaging elements, the distance between such elements selected to engage opposite flat portions of the head of a bolt received therein;

d. said plate member extending between said head engaging elements and providing an aperture generally centrally thereof for passing the shaft of a bolt therethrough; and,

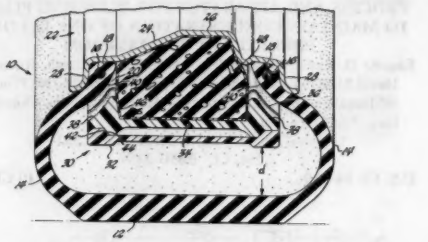
e. at least one oppositely extending guiding ear arranged on said plate member, the dimension of said guiding ear permitting the same to be received into the smaller portion of the T-Slot and at least one guiding element arranged on said guiding ear and directed toward said aperture means for guiding upon the smaller portion of the T-Slot of the machine tool table.

4,183,388

RUN-FLAT TIRE HAVING INTERNAL SUPPORT MEANS

Donald C. Cassidy, Bloomfield Hills, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Jul. 24, 1978, Ser. No. 927,505
Int. Cl.[2] B60C *17/04*
U.S. Cl. 152—158 **3 Claims**



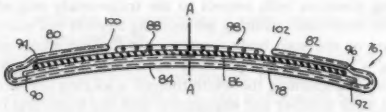
1. In combination, a pneumatic tire having an outer annular tread portion and a pair of oppositely disposed sidewalls extending inwardly from said tread portion, each of said sidewalls terminating in an annular bead disposed radially inwardly from said tread portion, said beads being laterally spaced from one another to define an annular opening leading to the interior of said tire, an annular rim for said tire having a pair of laterally spaced and outwardly extending flanges formed on oppositely disposed sides thereof for sealingly receiving said beads of said tire when said tire is inflated, a tire stabilizer assembly comprising an endless outer ring mounted within said tire intermediate and spaced apart from said sidewalls and further comprising an inner ring having annular side surfaces formed to match the corresponding inner surfaces of said beads, said rings being of resilient polymeric material and having cooperating interlock means for securing said rings to one another, and circumferentially oriented and preloaded support means confined between said inner ring and said rim and operatively disposed in said annular opening of said tire for retaining said inner and outer rings at a predetermined radial location intermediate said rim of said outer tread portion during normal operation of said tire, said preloaded support means being adapted to be compressed by said annular tread portion to permit said side surfaces of said inner ring to be forced against said beads to thereby retain said beads in sealing engagement with said flanges while said outer ring directly contacts and supports said outer tread portion in response to deflation of said tire.

4,183,389

HEAVY DUTY PNEUMATIC TIRE

Karl A. Grosch, Roetgen, Fed. Rep. of Germany, assignor to Uniroyal GmbH, Aachen, Fed. Rep. of Germany

Filed Apr. 11, 1978, Ser. No. 895,322
Claims priority, application Fed. Rep. of Germany, May 3, 1977, 2719798
Int. Cl.[2] B60C *9/22*
U.S. Cl. 152—361 FP **6 Claims**



1. A pneumatic tire including:

(a) a carcass having a crown region;

(b) a tread portion surrounding said crown region; and

(c) a reinforcement belt disposed circumferentially about said crown region, between said carcass and said tread, said reinforcement belt comprising:

(i) a first ply of tire cord fabric having its lateral edge portions folded over to form skirts with the balance of said first ply forming a main portion having an axial width of said reinforcement belt, and

(ii) a second ply of tire cord fabric positioned with respect to said main portion to clamp said main portion onto said carcass and impart to said carcass in said crown region a substantially flat-cross sectional configuration, said cords forming an angle of substantially 0° with respect to the equatorial plane of said pneumatic tire, said tire further including a first intermediate ply of tire cord fabric wherein said cords are oriented at an angle of from about 16° to about 32° with respect to the equatorial plane of said pneumatic tire superimposed upon said main portion and a second intermediate ply of tire cord fabric wherein said cords are oriented at an angle of from about at least 32° to about 70° with respect to the equatorial plane of said pneumatic tire, said skirts folded onto said first and second intermediate plies, said second ply having an axial width less than the axial distance between said free edges on said intermediate plies.

4. A pneumatic tire including:

(a) a carcass having a crown region;

(b) a tread portion surrounding said crown region; and

(c) a reinforcement belt disposed circumferentially about said crown region, between said carcass and said tread, said reinforcement belt comprising:

(i) a first ply of tire cord fabric having its lateral edge portions folded over to form skirts with the balance of said first ply forming a main portion having an axial width of said reinforcement belt; and

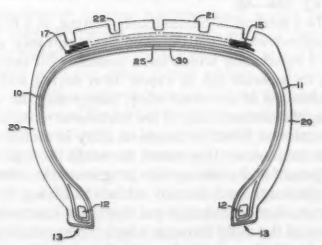
(ii) a second ply of tire cord fabric positioned with respect to said main portion to clamp said main portion onto said carcass and impart to said carcass in said crown region a substantially flat cross-sectional configuration, said cords forming an angle of substantially 0° with respect to the equatorial plane of said pneumatic tire, said tire further including an intermediate ply of tire cord fabric wherein said cords are oriented at an angle of from about 16° to about 32° with respect to the equatorial plane of said tire, said intermediate ply having an axial width less than the axial distance between said free edges of said skirts so that said intermediate ply may be positioned therebetween on said main portion, said second ply having an axial width greater than the axial distance between said free edges on said skirts and superimposed upon said skirts and said intermediate ply.

4,183,390

PUNCTURE-SEALING TIRE

Robert W. Halliman, Medina, Ohio, assignor to The B.F. Goodrich Company, New York, N.Y.

Filed Apr. 28, 1977, Ser. No. 791,761
Int. Cl.[2] B60C *5/00*
U.S. Cl. 152—347 **26 Claims**



1. A puncture-sealing tubeless pneumatic tire comprising two spaced inextensible beads, a ground contacting tread portion, a pair of individual sidewalls extending radially inward from the axial outer edges of said tread portion to join the respective beads, a carcass portion, and an integral layer of vulcanized sealant rubber disposed inwardly of said carcass portion, said sealing layer comprising at least one polymer selected from the group consisting of cis-polyisoprene and natural rubber, wherein said sealant layer has a vulcanized Shore A durometer of from about 25 to about 40 and a thickness in the range of from about 1 to about 50 percent of the total tire thickness, and wherein said sealant layer is substantially free of antioxidants.

4,183,391

VEHICLE TIRE

Jean C. Romand, Mareil en France, France, assignor to Pneumatiques, Caoutchouc Manufacture et Plastiques Kleber-Colombes, France

Filed Apr. 12, 1977, Ser. No. 786,771
Claims priority, application France, Apr. 12, 1976, 76 10621
Int. Cl.[2] B60C *9/18*
U.S. Cl. 152—361 R **4 Claims**

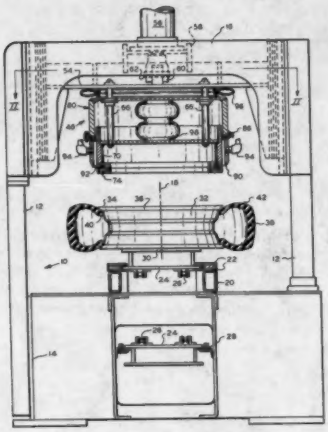
1. A tire having a radial carcass, a tread, and a belt under said tread extending transversely approximately the width of the tread, said belt comprising a pair of inner and outer superimposed plies, the other ply of said pair of plies being narrower than the inner ply of said pair of plies, each of said plies being made of cables having a high modulus of elasticity and forming slight opposite angles on the order of 20° with respect to the equatorial plane of the tire, outer lateral strips arranged on the outer ply along the outside edges of the outer ply and inner lateral strips arranged on the inner ply along the outside edges of the inner ply, a portion of each of said inner lateral strips extending between said inner and outer plies, each of said lateral strips extending transversely from an outside edge of a belt ply inward toward the center of the belt a distance of 20–40 mm., being co-extensive with the circumferential length of one of said plies, and being comprised of a layer of flexible circumferential cables embedded in rubber.

2. A tire having a radial carcass, a tread, and a belt under said tread extending transversely approximately co-extensive with the width of the tread, said belt comprising a pair of superimposed inner and outer plies, the outer ply of said plies being narrower than the inner ply, each of said plies being made of cables having a high modulus of elasticity and forming opposite slight angles on the order of 20° with respect to the equatorial plane of the tire, inner lateral strips of an anisotropic rubber blend provided with short fibers oriented in the circumferential direction arranged on the inner ply on the outside edges thereof, a portion of each of said inner lateral strips extending between said inner and outer plies, and outer lateral strips made of a layer of flexible circumferentially oriented cable in rubber arranged on the outer ply on the outside edges thereof each of said lateral strips extending transversely from an outside edge of a belt ply inward towards the center of the belt a distance of 20–40 mm.

4,183,392
STATIC TIRE INFLATOR

John P. Kane, Sterling Heights, Mich., assignor to Allied Steel & Conveyors, Detroit, Mich.

Filed Aug. 14, 1978, Ser. No. 933,494
Int. Cl.[2] B60C 25/06
U.S. Cl. 157—1.1 6 Claims

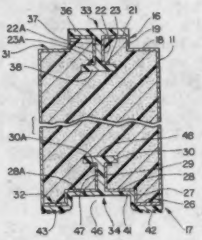


1. Apparatus for inflating tubeless tires having sidewalls and beads upon rimmed wheels having an axis comprising, in combination, an elongated frame having an axis, a wheel supporting region and an inflation head supporting region, wheel supporting means defined on said frame at said wheel supporting region supporting a wheel coaxial with said frame axis wherein the wheel rims are perpendicular to said frame axis, an inflation head movably mounted upon said head supporting region having an axis coaxial with said frame axis, and movable in a direction parallel to said frame axis toward and away from said wheel supporting means between retracted and extended positions, first translation means mounted on said frame selectively positioning said head between said retracted and extended positions, said head including an annular rim seal ring and an annular tire sidewall seal ring each concentric with each other and said frame axis, said rim seal ring being fixed with respect to said head and within and radially spaced from said tire sidewall seal ring defining an air chamber therewith and including an annular seal edge sealingly engaging a wheel rim at said inflation head extended position, means mounting said tire sidewall seal ring upon said inflation head for relative movement thereto parallel to said axis between sidewall compressing and sidewall release positions, second translation means mounted upon said head selectively translating said tire sidewall seal ring between said sidewall compressing and release positions, an annular tire sidewall seal edge defined on said sidewall seal ring adapted to sealingly engage the tire sidewall at said sidewall compressing position, said tire sidewall seal ring adapted to displace the tire bead from the wheel rim at said sidewall compressing position to establish communication between said air chamber and the interior of said tire, and a source of pressurized air communicating with said air chamber whereby compressed air may be selectively supplied to the interior of the tire during compressing of the tire sidewall and release of the tire sidewall permits engagement of the tire bead and wheel rim to retain the tire in inflated condition.

4,183,393
HEAT INSULATED DOOR

Morris W. Bailey, Fort Worth, Tex., assignor to Overhead Door Corporation, Dallas, Tex.

Filed Mar. 27, 1978, Ser. No. 890,049
Int. Cl.[2] E06B 3/16; E04B 1/62
U.S. Cl. 160—232 9 Claims



1. In a heat insulative door, the combination comprising:
inner and outer metallic panels approaching but not contacting each other at opposite first and second edges thereof;
first sealing means of highly heat insulative material positioned between said panels at said first and second edges for preventing the escape of flowable material from within said panels outwardly thereof;
second sealing means closing opposite third and fourth edges of said panels;
heat insulative foamed material inserted under pressure into the space between said inner and outer panels and prevented from escaping therebetween by said first and second sealing means, the combination being further comprised in that said panels approach each other at said first and second edges with outer surfaces in turn carrying reversely bent parallel portions extending inwardly of said door and terminating in flanges extending away from each other, said first sealing means having an elongate base element extended inwardly of said door along and snugly between said parallel portions and an inner cross element on the inward end thereof lying against said flanges and an outer cross element on the outward end thereof lying against said outer surfaces, said foamed material bearing against said flanges and said inner cross element to urge same snugly together in a tight seal.

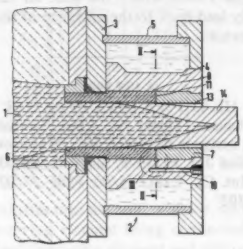
4,183,394
METHOD AND APPARATUS FOR HORIZONTAL CONTINUOUS CASTING

Klaus Viessmann, Marbach-Rielinghausen, Fed. Rep. of Germany, assignor to Kreidler Werke GmbH, Fed. Rep. of Germany

Filed Dec. 14, 1977, Ser. No. 860,470
Claims priority, application Fed. Rep. of Germany, Dec. 17, 1976, 2657207
Int. Cl.[2] B22D 21/02, 11/00
U.S. Cl. 164—66 5 Claims

1. In a method of continuously casting, in a horizontal tubular method which has opposed open entrance and discharge ends, a metal alloy which has a tendency for one of its components to separate out in vapor form during and shortly after solidification of the metal alloy, comprising the steps of maintaining the entrance end of the horizontal mold in communication with and filled by the metal alloy in molten form, so that the molten metal alloy enters the mold through said entrance end thereof and continuously progresses therethrough toward said discharge end thereof while solidifying in the mold in advance of said discharge end thereof at least next to the inner surface of the mold through which the metal alloy is indirectly cooled with the solidified metal alloy shrinking inwardly away from the inner surface of the mold to define therewith a shrink-

age gap extending from a location where the solidified metal skin of the casting initially shrinks inwardly away from the mold up to the discharge end thereof, said shrinkage gap thus being solely defined by the outer solidified skin of the casting and the inner surface of the mold, and introducing into said shrinkage gap around the entire surface of the casting which has shrunk inwardly from and is surrounded by the inner mold surface a gas which is inert to the vapor which tends to be



formed by a component of the metal alloy during and shortly after solidification thereof, said inert gas being introduced into said shrinkage gap simultaneously from a plurality of mold openings distributed circumferentially about the mold axis and situated at the region of said location where the metal skin of the casting initially shrinks inwardly away from the inner mold surface and in a manner such that the gas does not at any time interface with the molten metal alloy.

4,183,395

MULTI-PHASE STIRRER

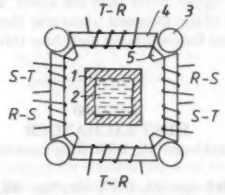
Sten Kollberg, Vesteras, Sweden, assignor to Asea Aktiebolag, Vesteras, Sweden

Filed Jan. 31, 1978, Ser. No. 873,787

Claims priority, application Sweden, Feb. 3, 1977, 7701157; Mar. 25, 1977, 7703421

Int. Cl.[2] B22D *27/02*

U.S. Cl. 164—147 **10 Claims**



1. A multi-phase stirrer for stirring the molten core of a cast slab from a continuous casting machine, said stirrer being divided into at least two partial stirrers with air gaps therebetween, each said partial stirrer including an iron core and being mounted together with the other partial stirrers to form the multi-phase stirrer with a magnetic circuit around the cast slab in which the iron cores of the partial stirrers are included, each said partial stirrer comprising at least one phase winding and fed with a number of phases at least one less than the total number of phases of the stirrer, each partial stirrer being arranged at different sides of the cast slab, and together with the other partial stirrers forming a rotary field around the cast slab, and additional iron cores arranged in the air gaps between said iron cores.

4,183,396

SEAL FOR A REGENERATIVE HEAT-EXCHANGER

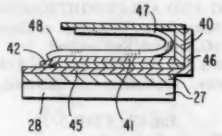
Karlheinz Kinast, Plochingen, and Klaus Wiegard, Esslingen, both of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany

Filed Nov. 3, 1977, Ser. No. 848,261

Claims priority, application Fed. Rep. of Germany, Nov. 12, 1976, 2651623

Int. Cl.[2] F28D *19/00*

U.S. Cl. 165—9 **10 Claims**



1. A seal for gas channels of a regenerative heat-exchanger, comprising sealing bar means operable to abut at a rotatable disk-shaped storage body means, and sealing diaphragm means which assisted by leaf spring means extends over the gap between the sealing bar means and an oppositely disposed housing wall, characterized in that the sealing diaphragm means includes leg portions, one of said leg portions being enclosed and pressed against the sealing bar means by a clamping strip means secured near its edge along the sealing bar means, said sealing diaphragm means having a back portion disposed opposite at least one abutment means arranged at the sealing bar means.

4,183,397

VEHICLE AIR CONDITIONING DEVICE

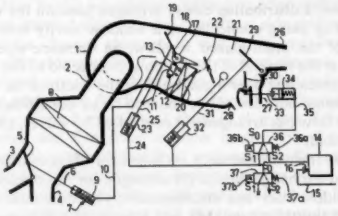
Emmanuel J. Poirier d'Ange d'Orsay, Toulouse, and René H. Paradis, Nogent le Rotrou, both of France, assignors to Societe pour l'Equipement de Vehicules, Issy Moulineaux and Societe Anonyme Francaise du Ferodo, Paris, both of, France

Filed Apr. 10, 1978, Ser. No. 895,023

Claims priority, application France, Apr. 15, 1977, 77 11484

Int. Cl.[2] F25B *29/00*

U.S. Cl. 165—14 **22 Claims**



1. A device for air conditioning an enclosed space with at least one mode of automatic temperature control, such device comprising an air circulating fan; means defining different flow paths for conditioning air through the device; one heat exchanger means through which the conditioning air can pass as it travels along at least one of said paths; movable means for directing the flow of conditioning air along said different possible circulation paths in the device; at least two fluid pressure operated actuators; two electromagnetic valves associated with the actuators of the device so that each actuator is controlled by at least one of the two electromagnetic valves and is effective to drive said movable means, each of said electromagnetic valves having first, second and third valve ports, said first port of each valve being interconnected through the valve with said second port when the electromagnetic valve is de-

energised, and with said third port when the electromagnetic valve is energised with a control signal; means to define a first fluid flow path for each valve including the said first and second ports of said valve; means to interconnect said first fluid flow paths of said two electromagnetic valves; two fluid feeds at different respective pressures; means connecting the two electromagnetic valves to respective ones of said two fluid feeds at different respective pressures; and means to connect at least one of said actuators to each of the two said first ports.

4,183,398

HEATING AND AIR-CONDITIONING SYSTEM

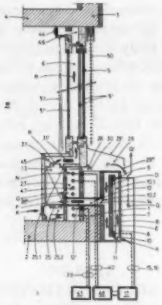
Rainer Ehrke, Schopfheim, Fed. Rep. of Germany, assignor to Rosenmund AG, Liestal, Switzerland

Filed Jan. 30, 1978, Ser. No. 873,682

Claims priority, application Switzerland, Oct. 6, 1977, 12256/77

Int. Cl.[2] F24D *5/10*

U.S. Cl. 165—53 **7 Claims**



1. Heating and air-conditioning system for one or multi-storied buildings with multi-glazed windows contained in the facade of the building, a fresh-air entrance arrangement arranged below at least one of these windows on the outside of the facade of the building, a fresh-air processing device connected to the fresh-air entrance arrangement with means to filter, heat or cool and humidify the fresh air and to expel the same over a distributing cavity arranged beneath the window, this cavity being connected to a window cavity between the panes of the multi-glazed window, an entrance opening arranged at the top end of the window, connected to the window cavity, extending over a good part of the width of the window and opening out toward the room to be air conditioned, and a stale air flow out arrangement controlled by valves, characterized in that,

(a) the fresh-air entrance arrangement (7) comprises a first heat exchange device (9) arranged on the outside of the window inter- and disconnected by air flow directing (11) and shutter means (14), and a fresh-air entrance opening (10) extending over at least a large part of the width of a window, and fresh-air processing device (13) connected to a fresh-air entrance channel (12) which passes through the window breast (1),

(b) the fresh-air processing device (13) lies underneath at least one of the mentioned windows (5) at the inside of the window breast opposite the fresh-air entrance arrangement and comprises a second heat exchange device (21, FIG. 2) which is flowed through by the total fresh air stream and the total stale air stream, these being kept separate from one another,

(c) that in the direction of the stale air stream there are means in front of, in and behind the fresh air processing device for suction, heat recovery from the stale air and to expel the stale air from the air-conditioned room over a separate streaming path (K-25/26, L–M–N–P), these means comprising a stale air flow-off cavity (27) in the region of the facade wall beneath the window, a connection channel (28) closable at its exit end by a shutter (30) and an adjacent stale air exit chamber (29) with an opening (29″) leading to the facade side, whereby the releasable shutter (30) at the end of the entrance cross section of the connection channel (28) is controlled dependently on the pressure in the air conditioned room (W) and

(d) that the stale air flow-off cavity (27) has opposite the fresh air processing device (13) a releasable entrance opening (26″) over which the stale air can be partly or completely lead back to the entrance of the fresh air processing device.

4,183,399

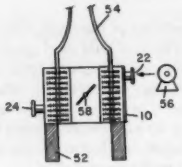
HEAT PIPE RECUPERATOR

Jobst W. Seehausen, Upper St. Clair Township, Allegheny County, Pa., assignor to Ionics, Inc., Watertown, Mass.

Filed Jul. 19, 1978, Ser. No. 925,739

Int. Cl.[2] E28D *15/00;* **F28F** *27/02*

U.S. Cl. 165—103 **1 Claim**



1. A flue gas heat pipe recuperator comprising:

a. an inner cylindrical shell defining a flue gas passage;

b. damper means within said inner cylinder for restricting the flow of flue gas through said cylinder;

c. an outer cylindrical shell having an inlet and outlet port;

d. an upper cover joining said inner and outer shells;

e. a lower cover joining said inner and outer shells, said shells and said covers defining a fluid heating chamber;

f. a plurality of heat pipes radially thread mounted within said chamber, said pipes having evaporator and condensor sections, said pipes extending through and supported by said inner cylinder such that said evaporator sections are positioned in said flue gas passage; said pipes slanted within said chamber having their condensor sections nearer the upper cover than the lower; and

g. a plurality of fins disposed transverse the longitudinal axis of said pipes for increasing their heat transfer characteristic.

4,183,400

HEAT EXCHANGER

Rolf Seifert, Laakbaum 16, 5608 Radevormwald, Fed. Rep. of Germany

Filed Apr. 22, 1977, Ser. No. 789,834

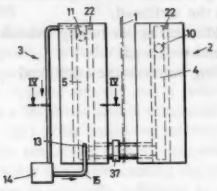
Claims priority, application Fed. Rep. of Germany, Apr. 27, 1976, 2618262

Int. Cl.[2] F28D *15/00*

U.S. Cl. 165—107 R **16 Claims**

1. In a heat exchanger for removing heat from a cabinet comprising: a heat-receiving element for receiving heat from outside of itself adapted to be positioned inside the cabinet and having an inner hollow space, inlet means and outlet means; heat-dissipating element adapted to be positioned outside the cabinet and having an inner hollow space, inlet means and outlet means; means connecting the corresponding inlet means and outlet means of the heat-receiving element and the heat-dissipating element to form a closed cycle in which a liquid circulates; and a means for circulating the liquid in the closed cycle between the heat-receiving element and the heat-dissipating element; the improvement wherein the circulating

means has no mechanical parts which directly contact the liquid and comprises: an air/liquid siphon consisting of one of the elements; an air moving pump; and an air supply means connecting the air moving pump to the air/liquid siphon; at least said heat-dissipating element further comprises a vertical uptake pipe integrally formed with said hollow space having said inlet means near its bottom and an overflow at its upper



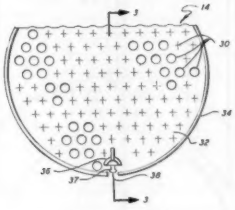
area which terminates into the hollow space, said outlet means of said heat receiving element being connected to said inlet means of said heat-dissipating element and said outlet means of said heat-dissipating element extends from the lower area of the hollow space of said dissipating element for removing the liquid from the same and supplying it to the heat-receiving element.

4,183,401

COMBINATION TUBE SHEET AND BAFFLE

William W. Bell, Jr., Marcellus, and Rudy C. Bussjager, Syracuse, both of N.Y., assignors to Carrier Corporation, Syracuse, N.Y.

Filed Sep. 28, 1977, Ser. No. 837,122
Int. Cl.[2] B22C *00/00, 13/02*
U.S. Cl. 165—159 **8 Claims**



1. In a heat exchanger for transferring heat from a first fluid to a second fluid having a shell for containing the flow of the first fluid and having mounted within the shell tubes for containing the flow of the second fluid, a combination tube support for securing the tubes and baffle for directing the flow of the first fluid which comprises:

a baffle body having tube retaining holes in which the tubes are mounted;

a resilient baffle lip mounted to the baffle body, said lip extending from the perimeter of the baffle body to the inside surface of the shell to form a relatively fluid tight seal therebetween; and

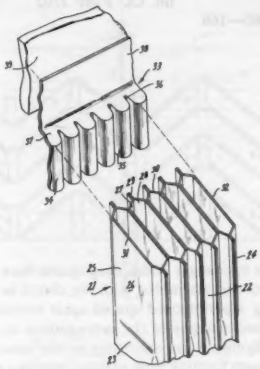
means for preventing the complete collapse of a portion of the baffle lip, said means including a foot accommodating notch in the baffle and a foot having a plurality of support surfaces at varying heights to fit within the notch and against the inside surface of the shell to support the baffle and the tubes at varying heights within the shell.

4,183,402

HEAT EXCHANGER HEADERING ARRANGEMENT

Ray W. Cotter, Snyder, N.Y., assignor to Union Carbide Corporation, New York, N.Y.

Filed May 5, 1978, Ser. No. 903,147
Int. Cl.[2] F28F *9/16*
U.S. Cl. 165—175 **14 Claims**

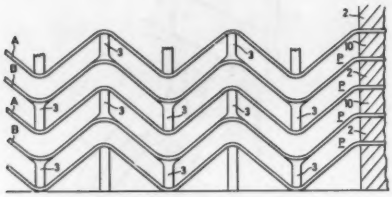


1. In a heat exchanger assembly including: a stacked array of heat exchange channel elements, wherein each channel element is bounded by thermally conductive pressure withholding walls, with a first fluid entrance opening at one end, a first fluid exit opening at the opposite end, and end sections each having a cross-section bounded by flat side walls and by edge walls comprising edge wall portions extending outwardly from said side walls and convergently with respect to each other, with the outermost ends of the edge wall portions being contiguous and coextensive with respect to one another to form a leak-tight edge wall and wherein adjacent channel elements in said array are stacked with their end section side walls in wall to wall contacting relationship and their end section edge walls in alignment to form a first entrance face at one end of said array and a first fluid exit face at the opposite end of said array, each said face having a perimeter defined by edge wall ends of the stacked channel elements and outermost side wall ends of the outermost channel elements in said array, and with said pressure withholding walls of adjacent channel elements in the interior of said array being disposed in spaced relationship with respect to each other for flow of a second fluid through said array in the space between said channel elements in heat exchange with said first fluid; an inlet header joined in flow communication with said first fluid entrance face for introduction of first fluid to said channel elements, and an outlet header joined in flow communication with said first fluid exit face for withdrawal of first fluid from said channel elements, each said header comprising the improvement of: sealing members extending along the end section edge walls of the channel elements at each side of the stacked array, each having a bearing surface with a generally corrugated contour of grooves and interposed ridges, with each of said grooves shaped so as to surround and abut the edge wall of a single channel element of said array with the interposed ridges extending inwardly and abutting the facing edge wall portions of adjacent channel elements, wherein the bearing surface of each sealing member is bonded to the abutted channel element edge walls associated therewith and has a length as measured parallel to the channel element longitudinal axes of at least 0.2 inch which is substantially greater than the thickness of said sealing member as measured perpendicular to the channel element longitudinal axes at a lower extremity of the grooves in said bearing surface thereof; and header tank means joined to said sealing members so as to leak-tightly enclose the associated face of the stacked array of heat exchange channel elements.

4,183,403
PLATE TYPE HEAT EXCHANGERS

Terence P. Nicholson, Calf Hall, Muggleswick, Derwentside, Co. Durham, England

Filed Sep. 17, 1975, Ser. No. 614,251
Claims priority, application United Kingdom, Feb. 7, 1973, 5359/73
Int. Cl.[2] F28F 3/02
U.S. Cl. 165—166 4 Claims

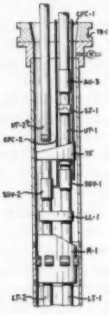


1. A heat exchanger comprising spacer bars carrying corrugated sheets and assembled with the sheets in parallel closely conforming superimposed spaced-apart relationship and with the peaks and troughs of the corrugations in adjacent sheets being in alignment and extending in the same direction, said adjacent sheets forming flow passages running along the corrugations thereof, means for supporting the sheets in said spaced-apart relationship, said means extending in engaging relation between the corrugation peaks of alternate pairs of adjacent sheets and between corrugation troughs of intervening pairs of adjacent sheets, and inlet and outlet means for passing a first heat-exchange fluid through said alternate pair of adjacent sheets in a first direction, and for passing a second heat-exchange fluid through the intervening pairs of adjacent sheets in a second direction opposite to said first direction.

4,183,404
PLURAL PARALLEL TUBING WITH SAFETY JOINTS OR RELEASE FROM SUSPENDED RECEPTACLE

Henry J. James, Littleton, Colo., and Carter R. Young, Argyle, Tex., assignors to Otis Engineering Corporation, Dallas, Tex.

Division of Ser. No. 270,977, Jul. 12, 1972, Pat. No. 4,143,712.
This application Nov. 13, 1978, Ser. No. 959,740
Int. Cl.[2] E21B 43/00
U.S. Cl. 166—133 5 Claims



2. Well flow control apparatus for a well having a wellhead and casing comprising:

a receptacle suspended in the well;

a plurality of lower tubings extending downwardly from the receptacle with at least one tubing in fluid communication with a producing formation;

packer means controlling flow through the casing tubing annulus;

a guide head having a plurality of tubings suspended therefrom;

a subsurface safety valve in each tubing suspended from said guide head;

latch means for latching said tubings suspended from said guide head in said receptacle in fluid communication with said lower tubings;

an upper tubing secured to said guide head and extending upwardly to the wellhead;

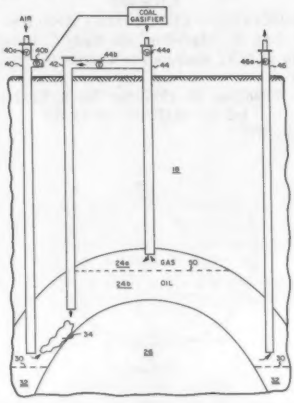
at least one additional upper tubing extending between the guide head and wellhead;

and means sealing between the additional upper tubing and guide head.

4,183,405
ENHANCED RECOVERIES OF PETROLEUM AND HYDROGEN FROM UNDERGROUND RESERVOIRS

Robert L. Magnie, 800 Metrobank, 475–17th St., Denver, Colo. 80202

Filed Oct. 2, 1978, Ser. No. 947,344
Int. Cl.[2] E21B 43/18, 43/24
U.S. Cl. 166—260 5 Claims



4. In an underground petroleum reservoir originally devoid of a gas cap and wherein an artificial gas cap has been created by injecting generated gases that are miscible in petroleum into said underground petroleum reservoir in such volume as to exceed the capacity of the petroleum to absorb the said generated gases, a method of producing fluids from the underground petroleum reservoir comprising the steps of

establishing a first communication passage from the surface of the earth into the said artificial gas cap,

establishing a second communication passage from the surface of the earth into the said petroleum,

withdrawing petroleum through the said second communication passage,

terminating withdrawal of petroleum through the said second communication passage, then

withdrawing gas from the said artificial gas cap through the said first communication passage.

4,183,406

METHOD OF TREATING A BOREHOLE USING GELLABLE POLYMERS

Robert D. Lundberg, Bridgewater, N.J.; Dennis E. O'Brien, Houston, Tex.; Henry S. Makowski, Scotch Plains, and Robert R. Klein, Berkley Heights, both of N.J., assignors to Exxon Production Research Company, Houston, Tex.

Filed Aug. 1, 1978, Ser. No. 930,121
Int. Cl.[2] E21B *33/138*
U.S. Cl. 166—295 **28 Claims**

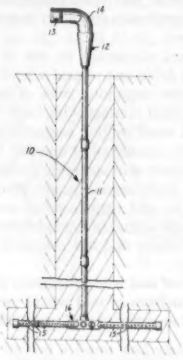
1. A method for treating a well penetrating a subterranean formation comprising introducing into said well a polymer solution which comprises a neutralized ionomeric polymer dissolved in an organic solvent and a polar cosolvent, said polymer having a backbone that is substantially soluble in the organic solvent said polar cosolvent solubilizing the pendant ionomeric groups, contacting said polymer solution with water to take up said polar cosolvent causing the polymer to aggregate and increase in viscosity sufficient to form a plugging material.

4,183,407

EXHAUST SYSTEM AND PROCESS FOR REMOVING UNDERGROUND CONTAMINANT VAPORS

Duane L. Knopik, 1741 Yorkshire Ave., Saint Paul, Minn. 55116

Filed Nov. 7, 1977, Ser. No. 848,894
Int. Cl.[2] E21B *43/00*
U.S. Cl. 166—314 **1 Claim**



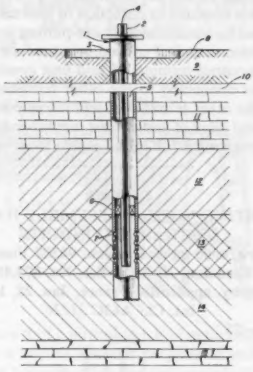
1. A process for removing contaminant vapors from contaminated underground areas and comprising the following steps:
   (1) excavating a shaft extending from the ground surface to a point within the contaminated area;
   (2) positioning within said contaminated area a plurality of elongate perforated collection elements;
   (3) connecting said elongate perforated collection elements to the lower end of a conduit having an upper end opening to the atmosphere, with the collection elements and conduit being angularly spaced from each other; and
   (4) exhausting air from the upper portion of said conduit to create less than atmospheric pressure in said conduit and in said collection elements whereby to draw contaminant vapors from the contaminated area into said collection elements and through said conduit to the ground surface.

4,183,408

GAS PRODUCTION FROM SOURCE ROCK

Paul E. Pilkington, Houston, Tex., assignor to Conoco, Inc., Ponca City, Okla.

Filed Nov. 3, 1978, Ser. No. 957,640
Int. Cl.[2] E21B *43/00*
U.S. Cl. 166—314 **4 Claims**



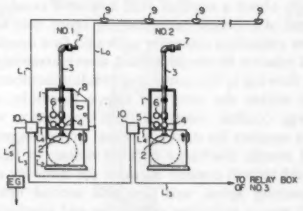
1. A process for producing hydrocarbons from a source rock in fluid communication with a geopressured section comprising:
   (a) producing fluids from the geopressured section to reduce pressure,
   (b) shutting in to allow migration of hydrocarbons from the source rock to the formerly geopressured section, and
   (c) producing the migrated hydrocarbons from the section.

4,183,409

AUTOMATIC FIRE-EXTINGUISHING SYSTEM

Makoto Iida, Fuchu, Japan, assignor to Security Patrols Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 695,035, Jun. 11, 1976, abandoned. This application Nov. 9, 1977, Ser. No. 850,009
Int. Cl.[2] A62C *35/00*
U.S. Cl. 169—11 **7 Claims**



1. An automatic fire-extinguishing system comprising: at least one automatic fire-extinguisher placed at a desired location within a region wherein automatic extinguishing should be effected when fire occurs therein, said at least one fire-extinguisher including integrally a bomb containing a fire-extinguishing gas under pressure and a gas jetting nozzle connected through a valve to said bomb; at least one fire sensor arranged at a desired location within said region; and an intermediate electric power supply source connected to said automatic fire-extinguishing system, said at least one fire extinguisher being provided with a relay to receive an actuation signal from outside and an electro-mechanical means for opening said valve, a gas jetting detecting switch for detecting gas pressure

in said bomb and a unit control circuit for controlling the actuation of said fire-extinguisher, said unit control circuit comprising a series circuit provided with an electric actuation circuit of said opening means and an on-off switch, which is controlled by said relay in a condition of connecting in a series, a terminal of said series circuit connected to a terminal of said intermediate power supply source, a switch means of said gas jetting detecting switch for interrupting power supply to said series circuit in response to reduction of internal gas pressure in said bomb and for simultaneously out-putting an electric potential of the other terminal of said intermediate power supply source to an output terminal of said unit control circuit, said switch means connected to the other terminal of said series circuit and the other terminal of said intermediate power supply source, said relay of said at least one fire-extinguisher being capable of receiving a fire signal issued from said fire sensor.

4,183,410

FIRE-FIGHTING NOZZLE ASSEMBLY HAVING TWO DISCHARGE CONDUITS

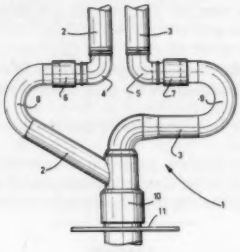
Guy Dion-Biro, 4600 au du Chateau, 94300 Vincennes, France

Filed Jan. 30, 1978, Ser. No. 873,490

Claims priority, application France, Jan. 28, 1977, 77 02371

Int. Cl.[2] A62C *31/26*

U.S. Cl. 169—25 **3 Claims**



1. A fire-fighting cannon nozzle assembly for simultaneous discharge of two fire fighting agents in any direction, said assembly comprising a stationary first conduit member for the input of a first fire extinguishing agent, a sleeve assembly rotatably and sealingly assembled with said first conduit member and forming therewith a bearing for rotation of the sleeve assembly about a vertical axis, a second conduit member for the input of a second extinguishing agent, said second conduit member extending coaxially with said first conduit member in spaced relation therewith in said sleeve assembly whereby the agents flowing in the respective conduit members do not intermingle within the rotatable sleeve assembly, a first nozzle discharge conduit means in fluid connection with said first conduit member for delivery of said first extinguishing agent, a second nozzle discharge conduit means in fluid connection with said second conduit member for delivery of said second extinguishing agent, said first and second nozzle discharge conduit means including respective end portions extending in parallel side by side relation and respective further portions forming separate non-coaxial fluid conduits, said further portions including curved parts and rotary sleeve members in the respective said further portions, said rotary sleeve members having axes substantially aligned with each other and extending perpendicular to the axis of rotation of said sleeve assembly to enable the end portions of said discharge conduit means to rotate separately or simultaneously in parallel vertical planes, said cannon nozzle assembly further comprising a support member on which said sleeve assembly is mounted and through which said first and second conduit members pass coaxially, said sleeve assembly having an inner sleeve part fixed to said support member and assembled with said first conduit member, an outer part disposed coaxially with said inner sleeve part and assembled with said first nozzle discharge conduit means, ball bearings disposed between said inner and outer sleeve parts, and an upper bearing sleeve portion provided with seals and lubrication means, said upper bearing sleeve portion supporting said second nozzle discharge conduit means and an end portion of said second conduit member entering said second discharge conduit means.

4,183,411

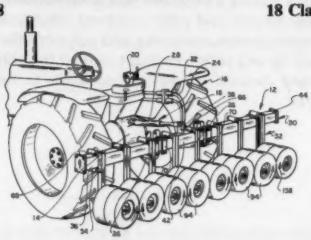
WEED PULLER APPARATUS

Daniel T. Bourquin, Colby, Kans., assignor to Bourquin Design and Mfg., Inc., Colby, Kans.

Filed Jan. 9, 1978, Ser. No. 868,044

Int. Cl.[2] A01D *27/04, 25/04*

U.S. Cl. 171—58 **18 Claims**



1. A weed puller apparatus adapted to be connected to a vehicle such as a farm tractor to be pulled through a crop having weed members therein to be removed, comprising:

(a) a main support member connected to the farm tractor;

(b) weed pulling means connected to said main support member having cooperating pairs of weed pulling assemblies;

(c) adjacent ones of said weed pulling assemblies each having a wheel member in frictional contact with an adjacent wheel member;

(d) power means connected to one of said weed pulling assemblies to drive one of said wheel members which, in turn, drives the remaining ones of said wheel members being in frictional contact with each other; and

(e) each of said weed pulling assemblies includes a support shaft assembly connected at one end to said wheel member and a support arm assembly connected at one end to said support shaft assembly and pivotally connected at another end to said main support means; whereby said wheel members resemble a pendulum structure and each being pivotal about said main support means and relative to each other;

whereby only one of said wheel members are positively driven and cooperating surfaces of said wheel members are operable to grasp the weed member to pull upwardly of the supporting soil.

4,183,412

ROTARY HARROWS

Cornelis van der Lely, 7, Bruschenrain, Zug, Switzerland

Continuation of Ser. No. 580,906, May 27, 1975, abandoned, which is a division of Ser. No. 320,873, Jan. 4, 1973, Pat. No. 3,897,831. This application Sep. 7, 1976, Ser. No. 720,772

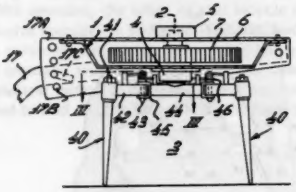
Claims priority, application Netherlands, Jan. 5, 1972, 7200086

Int. Cl.[2] A01B *33/14*

U.S. Cl. 172—59 **6 Claims**

6. A rotary harrow comprising a plurality of soil-working members rotatably mounted on a frame and said members being positioned in a row that extends transverse to the normal direction of travel of said harrow, said soil-working members each being rotatable about a respective upwardly extending shaft and driving means connected to rotate said members

about corresponding axes defined by their shafts and normally work overlapping paths, each member comprising an elongated horizontal central support, the outer ends of said support being pivoted to corresponding arms, a downwardly extending soil-working tine being mounted adjacent the outer end of each arm and a soil-working portion of said tine being laterally spaced from said shaft, the pivot connection between each arm and the outer portion of said support having an upwardly



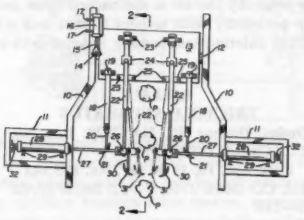
extending axis that extends substantially parallel to the axis of rotation of the corresponding soil working member and said arm with tine being deflectable about the pivot axis of said connection with respect to the normal direction of rotation of said member responsive to soil conditions, the soil-working portion of each tine maintaining a substantially constant working depth during deflection thereof, and means biasing said arm in normal radial alignment with said support.

4,183,413

CULTIVATOR WITH VERTICALLY AND SIDEWARDLY MOVABLE HOES

Melvin C. Boston, 5450 Salem-Unity Rd., Salem, Ohio 44460

Filed Feb. 8, 1978, Ser. No. 876,000
Int. Cl.[2] A01B *65/02*
U.S. Cl. 172—646 **3 Claims**



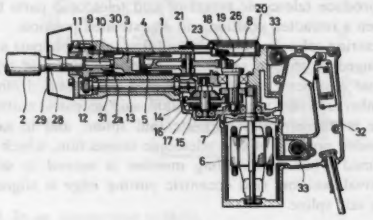
1. In a cultivator having a frame and means for moving it along a row of longitudinally spaced plants to be cultivated; a transversely positioned body member pivoted at its ends to said frame, a pair of trailing arms fixedly mounted on the body member and a pair of secondary trailing arms movably mounted on said body member and interposed completely between and free of said fixed trailing arms so that said secondary trailing arms may be moved inwardly toward each other without interference of said fixed arms, ground engaging hoes on the ends of said fixed and secondary trailing arms whereby said hoes on said secondary trailing arms may be moved between said plants of said row, motion imparting devices on said frame and extending laterally outwardly from the ends of said secondary trailing arms and means connecting said motion imparting devices to said secondary trailing arms, said motion imparting devices comprising means for moving said secondary trailing arms laterally, said devices further permitting said secondary trailinng arms to move vertically.

4,183,414

PERCUSSION TOOL AND CARTRIDGE-TYPE OIL TANK THEREFOR

Tadashi Tamai, and Takashi Kojima, both of Obama, Japan, assignors to Shibaura Engineering Works Co. Ltd., Tokyo, Japan

Filed Feb. 2, 1978, Ser. No. 874,407
Claims priority, application Japan, Feb. 4, 1977, 52-10765
Int. Cl.[2] E21C *3/00*
U.S. Cl. 173—118 **7 Claims**



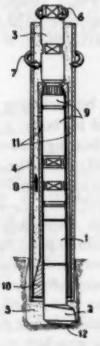
1. A percussion tool comprising a tool main body holding at its forward end a tool bit which is projectable and retractable, a slidable striker housed within said tool main body for beating the inner end of said tool bit, said striker being integral with a cylinder having a piston fitting therein for giving an increased internal pressure, and crank means connected to said piston and turnable by drive means, wherein said crank means, when turned, brings said piston into reciprocation thereby repeatedly varying the pneumatic pressure within said cylinder to cause said striker to follow the motion of said piston to repeatedly beat the inner end of said tool bit, said percussion tool further characterized in that an oil tank of the cartridge type is detachably installed in the main body of the tool, and an oil absorbent wick extends from said oil tank and is held in contact with said crank.

4,183,415

DRILLING APPARATUS

Pierre Stenuick, Fontaine l'Eveque, Belgium, assignor to Stenuick France, Orleans, France

Filed Nov. 20, 1978, Ser. No. 962,792
Claims priority, application France, Nov. 21, 1977, 77 34849
Int. Cl.[2] E21B *1/06*
U.S. Cl. 175—92 **2 Claims**



1. Apparatus for drilling a hole in the ground comprising:
tubing means for shoring up the walls of the drilled hole;
a drilling member comprising a hammer adapted to be operated by compressed gas and having an eccentric cutting edge, said drilling member extending in said tubing means

and being adapted to assume a working position in which said cutting edge extends outside said tubing means and a removal position in which said cutting edge is retracted within said tubing means;

extension tube means for supplying compressed gas to said hammer;

a helicoidal telescopic connection means connecting said extension tube means to said hammer and comprising a first telescopic part connected to said extension tube means and a second telescopic part connected to said hammer, said parts being relatively rotatable through 180° to produce telescopic travel of said telescopic parts between a retracted position and an extended position;

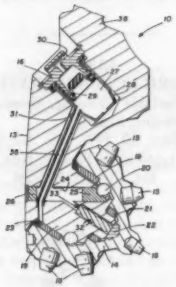
a decentring spline mounted on said first telescopic part and arranged so that in said retracted position of said telescopic connector, which is assumed when said drilling member is in said working position, said eccentric cutting edge is diametrically opposite said spline, and in said extended position of said telescopic connection, which is assumed when said drilling member is moved to said removal position, said eccentric cutting edge is aligned with said spline.

4,183,416

CUTTER ACTUATED ROCK BIT LUBRICATION SYSTEM

D. F. Walters, Dallas, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Aug. 18, 1978, Ser. No. 934,930
Int. Cl.[2] E21B *9/08, 9/35*
U.S. Cl. 175—229 **3 Claims**



1. In an earth boring bit including a bit body with a bearing pin extending from said bit body, a rotatable cutter mounted upon said bearing pin, bearing means and seal means between said bearing pin and said cutter, the improvement comprising:

a lubricant circulation system including a lubricant reservoir in said bit body;

first passage means for channeling lubricant from said lubricant reservoir to said bearing means;

second passage means for channeling lubricant from said bearing means to said lubricant reservoir;

a bore extending into said bearing pin, said bore in open communication with said first passage means; and

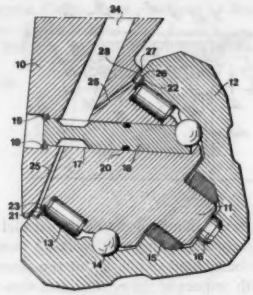
a rotary pump means attached to said rotatable cutter and extending into said bore, said rotary pumping means including a generally cylindrical member with a spiral screw groove, said generally cylindrical member extending from said rotatable cutter for pumping lubricant through said first and second passage means.

4,183,417

ROLLER BIT SEAL EXCLUDED FROM CUTTINGS BY AIR DISCHARGE

Bert G. Levefelt, Sandviken, Sweden, assignor to Sandvik AB, Sandviken, Sweden

Filed Apr. 3, 1978, Ser. No. 892,866
Claims priority, application Sweden, Apr. 1, 1977, 7703810
Int. Cl.[2] E21C *13/00;* **E21B** *9/10*
U.S. Cl. 175—339 **6 Claims**



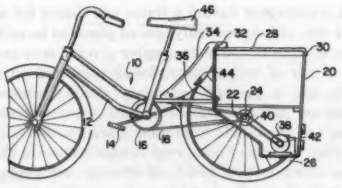
6. A roller bit having a main body and a plurality of roller cutter assemblies, each of which is mounted upon a downwardly extending leg and a bearing pin which extends downwardly and radially inwardly from the leg, each of said cutter assemblies comprising, a roller cutter mounted upon said pin with there being an annular space between said pin and said roller cutter, a plurality of bearings positioned within said annular space and supporting said roller cutter upon said pin to rotate about a predetermined axis, said leg and the periphery of said roller cutter forming an annular gap between annular surfaces of said leg and the periphery of said roller cutter, a seal separating said annular gap from said annular space, said leg including a passageway for air which is delivered to said annular gap whereby the air is discharged from said annular gap radially outwardly with respect to said axis while being prevented from entering said annular space due to said seal.

4,183,418

TRICYCLE APPARATUS

Herminia Dudas, Daphne St., No. 7770, Box No. 197, Port Hardy, B.C., Canada (V0N 2P0)

Filed Apr. 10, 1978, Ser. No. 895,143
Int. Cl.[2] B60K *1/00, 17/02;* **B62D** *61/08*
U.S. Cl. 180—216 **9 Claims**



1. A tricycle apparatus comprising a tricycle frame having a pair of foot pedals, said foot pedals secured to a first sprocket, said first sprocket rotatably secured to said tricycle frame, a pair of axles, one of said paid of axles carrying a second sprocket, said second sprocket coupled to said first sprocket, a housing, said housing fixedly secured to said frame, said housing rotatably supporting said pair of axles, a wheel secured to each of said pair of axles, means to releasably lock said pair of

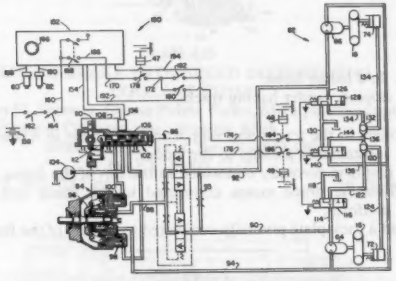
axles together against separate rotation, a third sprocket, a fourth sprocket, said third sprocket carried by said one of said pair of axles, said fourth sprocket carried by the other of said pair of axles, an electric motor, said electric motor having two output shafts, a pair of slip clutches, said pair of slip clutches mounted separately to said two output shafts, a fifth sprocket and a sixth sprocket, said fifth sprocket carried by one of said pair of slip clutches, said sixth sprocket being carried by the other of said pair of slip clutches, a pair of bicycle chains, one of said pair of bicycle chains coupling said third sprocket to said fifth sprocket, the other of said bicycle chains coupling said fourth sprocket to said sixth sprocket, said electric motor being mounted within said housing, a battery, said battery being mounted within said housing, said battery coupled to said electric motor, a controller, said controller electrically coupled to said electric motor and said battery.

4,183,419

HYDROSTATIC FRONT WHEEL DRIVE SYSTEM

John I. Henn, Dubuque, and Donald K. Pfundstein, Peosta, both of Iowa, assignors to Deere & Company, Moline, Ill.

Filed May 30, 1978, Ser. No. 910,571
Int. Cl.[2] B60K *25/04*
U.S. Cl. 180—243 **2 Claims**



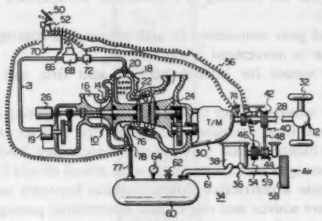
1. In combination with a vehicle including a reversible main traction drive transmission system connected to drive main traction drive wheels, and first and second auxiliary traction wheels, an auxiliary traction drive system, comprising; a reversible variable displacement pump including a direction and displacement controller; first and second hydraulic motors connected in parallel with each other in a closed loop hydraulic circuit connecting the pump to the motors; first and second drive connection means respectively connecting the first and second motors to the first and second auxiliary traction wheels; said closed loop hydraulic circuit comprising a pair of supply-return lines having first ends connected in fluid communication with a first port of the pump and having second ends respectively connected to first ports of the first and second motors, and a further supply-return line connected between respective second ports of the motors and a second port of the pump; and auxiliary drive speed control means connected between the main traction drive transmission system and the direction and displacement controller of the pump for controlling the latter, in response to the main traction drive system, such as to cause the pump to displace fluid to the motors in such direction and quantity as to result in respective rotors of the motors being rotated at speeds which are a preselected percentage of the average speed of rotation of the main traction drive wheels.

4,183,420

GAS TURBINE ENGINE CONTROL SYSTEM

Keijiro Kinoshita, Yokohama, Japan, assignor to Nissan Motor Company, Limited, Yokohamo, Japan

Division of Ser. No. 715,834, Aug. 19, 1976. This application Jan. 9, 1978, Ser. No. 867,875
Claims priority, application Japan, Aug. 20, 1975, 50-101006
Int. Cl.[2] G60K *5/02*
U.S. Cl. 180—301 **4 Claims**



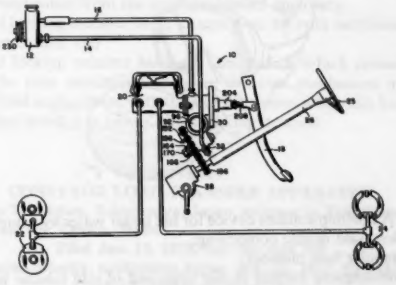
1. In an automotive vehicle,
a twin shaft type gas turbine having a combustor, a compressor and an output shaft connectable to a drive shaft of the vehicle via a clutch;
energy producing means for producing a storable energy;
first drive means for providing temporary drive connection between said drive shaft of said vehicle and said energy producing means to produce an engine braking effect to induce deceleration of said vehicle;
storage means connected to said energy producing means for receiving and storing said storable energy;
second drive means connected to said compressor for maintaining the rotational speed of said compressor above a predetermined level upon being supplied with said storable energy stored in said storage means; and
control means for selectively causing said first drive means to provide said temporary drive connection between said drive shaft and said energy producing means, supplying said second drive means with said storable energy stored in said storage means and cutting the supply of fuel to the combustor of said turbine.

4,183,421

STEERING CONTROL FOR AN INTEGRATED BRAKE AND STEERING SYSTEM

Arthur K. Brown, South Bend, Ind., assignor to The Bendix Corporation, Southfield, Mich.

Filed Mar. 31, 1978, Ser. No. 892,051
Int. Cl.[2] B62D *5/08*
U.S. Cl. 180—145 **6 Claims**



1. In a vehicle having an integrated fluid power-assisted braking and steering system, a steering mechanism comprising:

a housing having first and second bores therein, means for communicating said first bore with a fluid pressure source, a pair of operational passages for communicating said first bore with said second bore, and an outlet passage for communicating said first bore with said braking system;

a piston movable in said second bore and cooperating with said housing to form a pair of pressure chambers, each of said chambers communicating with a respective operational passage;

a first gear for rotating in response to an operator steering signal;

a second gear connected to said piston and rotating in response to movement of said piston;

linkage means for interconnecting said first and second gears;

a rotary valve member in said first bore for rotating to regulate said fluid pressure within said first and second pressure chambers, said valve member including lands, slots, and passages which cooperate with a wall of said first bore to create a restrictive flow condition between said fluid pressure source and one of said operational passages, said restrictive flow condition producing a pressure differential between said first and second pressure chambers;

actuator means for pivoting in response to tension produced in said linkage means, said tension being produced in response to rotation of said second gear relative to said first gear, said rotary valve member rotating in response to pivoting of said actuator means from a neutral position to an angularly displaced position with respect to said housing to create said restrictive flow condition and said pressure differential, said piston moving in response to said pressure differential from a neutral position to a displaced position with respect to said housing to provide a power assist in the operation of said steering system; and

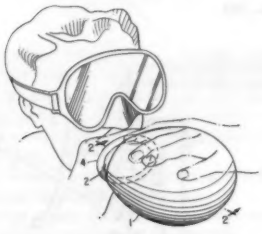
a torsion bar with one end fixed relative to said housing and another end fixed relative to said rotary valve member, said second gear rotating in response to said movement of said piston to eliminate said tension in said linkage means to allow said torsion bar to return said rotary valve to said neutral position with respect to said housing to eliminate said pressure differential and to thereby maintain said piston in said displaced position until another operator steering signal is applied to said first gear.

4,183,422

UNDERWATER COMMUNICATIONS DEVICE

David W. Williams, 7716 Guildford, Hanover Park, Ill. 60103

Filed Jan. 12, 1978, Ser. No. 868,826
Int. Cl.[2] G10K *13/00*; A62B *7/00*; A63H *3/06*
U.S. Cl. 181—173 **16 Claims**



1. A communications device for use under water by a human speaker, said device comprising:

a tubular base member;

a mouthpiece located at one open end of said tubular base member and sufficiently large to extend around and over the mouth of the speaker to substantially form an air seal thereabout such that air used by the speaker while voicing sounds passes through said mouthpiece into said tubular base member; and

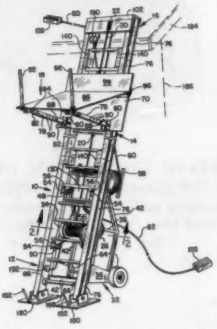
means attached to said tubular base member for transmitting voiced sounds, free of air bubbles, as vibrations to the surrounding water, said means including an inflatable air bag mounted about another open end of said tubular base member in a manner so as to receive said air used by the speaker while voicing sounds into said mouthpiece, thereby preventing the escape of air bubbles from the device when transmitting said voiced sounds under water.

4,183,423

LADDER HOIST

James P. Lewis, 19306 NE. 29th Ave., Ridgefield, Wash. 98642

Continuation of Ser. No. 713,858, Aug. 12, 1976, abandoned.
This application Sep. 21, 1977, Ser. No. 835,159
Int. Cl.[2] B66B *9/20*
U.S. Cl. 182—103 **2 Claims**



1. In a ladder hoist,

a sloping, ladder having tracks,

a frame,

rollers in the tracks and supporting the frame in a position substantially parallel to the ladder,

a platform pivotally connected to the top of the frame,

adjustable brace means connected to the frame and the platform,

and a back plate pivotally connected to the top of the frame.

4,183,424

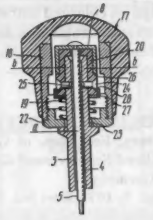
VEHICLE GEARCHANGE LEVER WITH CLUTCHSWITCH

Leonid A. Rumyantsev, Bolshaya Akademicheskaya ulitsa, 77, korpus 3, kv. 79; Jury K. Esenovsky-Lashkov, ulitsa Festivalnaya, 31, kvartal 125; Anatoly A. Lisevich, Koptevsky bulvar, 6, kv. 64; Jury L. Kanevsky, ulitsa Zatsepa, 13/6, kv. 25, all of Moscow; Vladimir P. Steshenko, ulitsa Shkolnaya, 31, kv. 97; Vladimir I. Guba, ulitsa Shkolnaya, 31, kv. 24, both of Zaporozhie; Vladimir A. Abramian, ulitsa Nogovitsina, 4, kv. 60, Izhevsk; Jury A. Tronin, ulitsa Avtozavodskaya, 4, kv. 52, Izhevsk; Petr V. Fedorov, ulitsa Voroshilova, 40, kv. 17, Izhevsk; Boris B. Nazarov, ploschad Pobedy, 2, kv. 22, and Mikhail A. Mironenko, ulitsa Grizodubovoi, 58, kv. 53, both of Melitopol, all of U.S.S.R.

Filed Apr. 21, 1977, Ser. No. 789,651
Int. Cl.[2] B60K *29/02*; H01H *27/06*
U.S. Cl. 192—3.58 **2 Claims**

1. A gearchange lever for effecting control of a vehicle gearbox and a clutch, comprising: a rod with a longitudinal hollow provided therein; a current conducting element accommodated in said longitudinal hollow, one end of said current conducting element being connected to said clutch for the purpose of effecting control of its engagement and disengagement; a sleeve made of an insulating material and removably mounted on the end of said rod; a contact constructed in the

form of a cup and mounted on said sleeve, said contact being electrically connected with the other end of said current conducting element; a hollow knob elastically mounted on said rod; a contact mounted in said knob; a shoulder provided on said rod for the bottom end of said knob to rest thereupon, the end of said rod being located together with the contact mounted thereon, inside said knob, there being a hole provided in said knob for said rod to fit therethrough with a clearance,



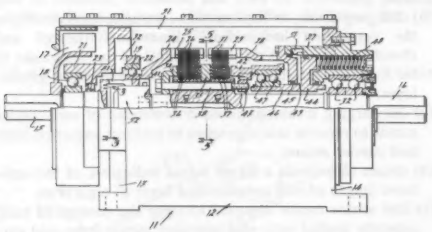
said knob being adapted to move relative to the rod for the purpose of closing said contacts in the process of gearchange, and the clearance of the rod in the hole being dimensioned so as to enable the contacts to be closed by moving said knob in the process of gearchange, said sleeve being attached to the rod by means of fastening disposed round the sleeve periphery slightly below the edge of the cup and being prevented from outward movement by provision of a spring-loaded flanged washer.

4,183,425

CLUTCH-BRAKE WITH SPEED DIFFERENTIAL COOLANT PUMP

Gordon M. Sommer, Grosse Pointe Farms, Mich., assignor to G. M. Sommer Company, Inc., Warren, Mich.

Filed Aug. 11, 1977, Ser. No. 823,630
Int. Cl.[2] F16D *13/72*
U.S. Cl. 192—113 B **10 Claims**



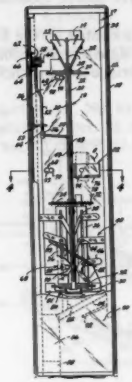
1. An oil-cooled drive assembly comprising a housing, input and output shafts extending from opposite sides of said housing, coacting drive elements within said housing and operative to drivingly connect said input and output shafts, pump means for supplying cooling fluid to said drive elements, said output shaft having a portion overlapping an end portion of said input shaft, said pump having a first element connected to one of said overlapping shaft portions and a second element connected to the other overlapping portion whereby the output of said pump will be proportional to the differential speeds between said shafts and said pump includes means movable in response to a change in the direction of rotation of said input shaft so as to maintain a constant direction of flow of said oil within said clutch-brake unit.

4,183,426

VENDING MACHINE WITH REMOVABLE COIN OPERATED MECHANISM

Jack S. Chalabian, Gardena, Calif., assignor to K-Jack Engineering Company, Inc., Gardena, Calif.

Filed Jul. 22, 1977, Ser. No. 818,121
Int. Cl.[2] G07F *5/08*
U.S. Cl. 194—67 **15 Claims**



1. In a vending machine having an enclosure for articles to be vended, a lockable door to said enclosure, and a coin operated locking mechanism to unlock said door when a predetermined combination of coins is received by said mechanism, the improvement comprising:

a coin mechanism enclosure;

releasable support means within the coin mechanism enclosure which is engagable with said coin mechanism to hold the coin mechanism in a predetermined position within the coin mechanism enclosure to control the opening of said door;

means to release said support means to permit the removal of said coin mechanism from the coin mechanism enclosure;

said means to release said support means including a locking member which is movable between a locking position and an unlocking position;

said locking member in its locking position exerting a force against the coin operated locking mechanism to move said mechanism into fixed engagement with said support means with the coin mechanism in its predetermined position to control opening of said door;

said locking member in its unlocking position permitting the movement of the coin mechanism out of fixed engagement with said support means to permit the removal of the coin mechanism from the coin mechanism enclosure;

said locking member being mounted on the coin mechanism enclosure, and

said locking member having a cam surface which contacts the coin mechanism to move the coin mechanism into fixed engagement with the support means when said locking member is moved to its locking position.

4,183,427

CONVEYOR LOAD TRANSFER APPARATUS

Hisao Tomikawa, Tokorozawa, Japan, assignor to Tsubakimoto Chain Co., Osaka, Japan

Filed Jun. 12, 1978, Ser. No. 914,794
Claims priority, application Japan, Jun. 22, 1977, 52-73329
Int. Cl.[2] B65G *47/36, 47/61*
U.S. Cl. 198—464 **2 Claims**

1. Conveyor load transfer apparatus, comprising:

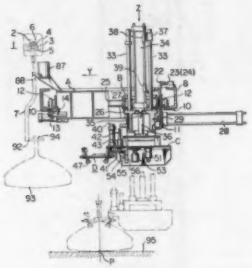
a follow-up carriage guided and supported to be movable in

a direction in which a conveyor moves and driven by a double-acting air cylinder;

a transverse carriage guided and supported on the follow-up carriage to be movable perpendicular to the running direction of the conveyor and driven back and forth by a transverse motor mounted on the follow-up carriage;

an article-handling segment elevatably guided and supported on the transverse carriage and driven up and down by an elevation drive source mounted on the transverse carriage;

a follow-up detector mounted on the follow-up carriage to generate deviation signals representing relative positions of the follow-up carriage and an article-supporting device of the conveyor;



a double-acting hydraulic cylinder expanding and contracting according to the motion of the follow-up carriage, and a pressure-compensating flow-rate regulating valve with a check valve connected between the two ports of said hydraulic cylinder;

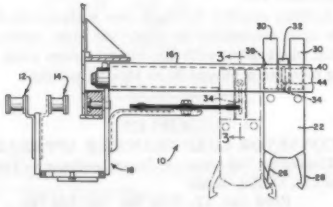
said elevation drive source comprising two individually controlled double-acting air cylinders, one of said air cylinders having a buffering device including a check valve connected between the two ports thereof and a throttle valve, with a check valve, connected to the rod-side port thereof; p1 wherein the opening of said pressure-compensating flow-rate regulating valve is controlled by said signals so that said follow-up carriage follows the moving article supporting device and transfers an article onto or off said article-supporting device with said article-handling segment while moving.

4,183,428

MOUNTING BAR AND GRIPPER JAW ASSEMBLY

Robert W. McGill, Munroe Falls, and Michael E. Winiasz, Lorain, both of Ohio, assignors to A-T-O Inc., Willoughby, Ohio

Filed Feb. 21, 1978, Ser. No. 879,128
Int. Cl.[2] B65G *29/00, 37/00, 25/00*
U.S. Cl. 198—479 **9 Claims**



1. A mounting assembly for gripper jaws in article casing and/or uncasing apparatus and comprising

a carrier bar for extending transversely of a longitudinal axis of the apparatus and engaging a driving and positioning conveyor means for movement through a fixed course, said carrier bar having a bottom surface,

a plurality of gripper jaw means operatively carried by and dependent from said carrier bar, and

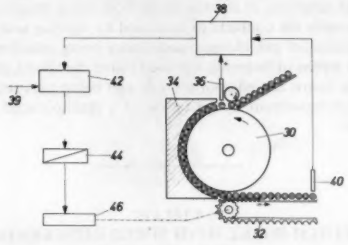
a pair of positioning members and a connecting shaft therefor for each of said gripper jaw means, said carrier bar being contoured to operatively engage and confine said members with said shaft engaging an individual gripper jaw means, and said carrier bar having a center slot in its bottom surface and an enlarged entrance and release opening connecting to said center slot for said members at a side area of said bottom surface.

4,183,429

APPARATUS IN A CIGARETTE PLANT

Hubert Bald, Gevelsberg, Fed. Rep. of Germany, assignor to Maschinenfabrik Alfred Schmermund GmbH & Co., Gevelsberg, Fed. Rep. of Germany

Filed Apr. 7, 1977, Ser. No. 785,705
Claims priority, application Fed. Rep. of Germany, Apr. 27, 1976, 2618297
Int. Cl.[2] B65G *43/08, 43/10*
U.S. Cl. 198—572 **1 Claim**



1. Apparatus in a high speed continuous cigarette processing plant for maintaining substantially constant the length of an accumulated layer of cigarettes, the apparatus comprising in combination:

(a) means for carrying cigarettes in a predetermined direction;

(b) charging means to displace said cigarettes transversely to the respective longitudinal dimensions thereof and thereby to load said cigarettes onto said carrier means to be accumulated thereon side-by-side in a single gapless layer;

(c) discharging means disposed downstream of said carrier means to remove said cigarettes in uniform sequence from said carrier means;

(d) means to provide a target signal indicative of the optimum length of said accumulated layer of cigarettes;

(e) first sensor means disposed to sense the passage of each cigarette loaded onto said charging means from said carrier means and to provide a first signal indicative of said passage;

(f) second sensor means disposed to sense the passage of each cigarette removed from said charging means to said discharing means and to provide a second signal indicative of said passage;

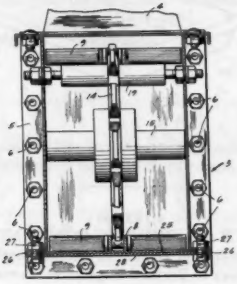
(g) a reversible digital counter arranged to count forwardly in response to said first signal and to count backwardly in response to said second signal; and

(h) means responsive to a control signal indicative of an instantaneous count state of said reversible counter and responsive to said target signal to so control the rate at which said cigarettes are removed from said carrier means by said discharging means that said length of said accumulated layer of cigarettes is maintained substantially constant.

4,183,430
GRAIN HANDLING FLIGHT CONVEYOR ASSEMBLY

William E. Hunter, Mackinaw, Ill., assignor to Hunter Mfg., Inc., Ill.

Filed Aug. 25, 1977, Ser. No. 827,546
Int. Cl.[2] B65G *19/28*
U.S. Cl. 198—735 6 Claims



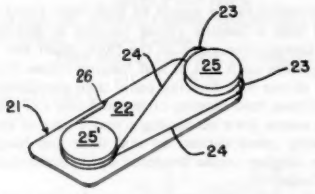
1. A material moving conveyor system including a sectionalized trough with a flight conveyor operable therein, said trough being closed at the top, and a bottom plate connected by a series of bolts to outwardly extending flanges on the sides of the trough, said trough having an inlet adjacent one end and an outlet at the other end, and wherein the improvement comprises

a wear plate lying flat on the inside face of said bottom plate and on the outside face of said bottom flanges, and said wear plate having a row of notches in a side margin thereof corresponding in number and placement to partially surround each of said bolts in that margin, whereby when the bolts along the opposite side are removed and the bolts along said side margins are loosened said bottom plate and said wear plate will tilt from the loosened bolts and said wear plate may be slid out of said trough without disturbing anything above said wear plate.

4,183,431
ACCESS SUTURE PACKAGE

Rolf D. Schmidt, Mohnton, and Earl M. Theodore, Reading, both of Pa., assignors to Sharpoint, Inc., Mohnton, Pa.

Filed Jun. 9, 1978, Ser. No. 914,276
Int. Cl.[2] A61L *17/02*
U.S. Cl. 206—63.3 9 Claims



1. A suture package comprising:

a support element;

a needle-receiving member mounted on the support element, the needle-receiving member comprising a body of pierceable, nonsloughing material;

a needle, a portion of which is inserted into a side surface of the needle-receiving member, the thickness dimension of the needle-receiving member being greater than the diameter of the needle;

a length of surgical thread attached to the needle;

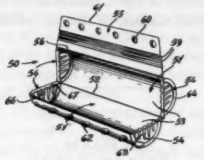
a wrapping means mounted on the support member, the wrapping means comprising a body having a peripheral wrapping surface; and

thread-retaining means on the support element for lightly frictionally retaining a portion of the thread, the thread extending from the needle and passing about at least a portion of the peripheral surface of the wrapping member and thence to the thread-retaining means.

4,183,432
TRANSPARENT CONTAINER FOR HOLDING A PREDETERMINED QUANTITY OF COINS

Réal F. Lemaire, 4711 Blvd. Allard, Drummondville, Quebec, Canada

Continuation-in-part of Ser. No. 911,700, Jun. 1, 1978, abandoned. This application Oct. 23, 1978, Ser. No. 953,930
Int. Cl.[2] A45C *11/28*
U.S. Cl. 206—0.82 13 Claims

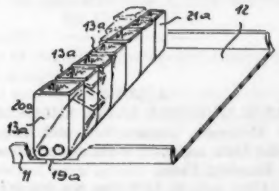


1. A re-usable cylindrical transparent coin holder comprising two open-faced receptacles formed from a transparent plastics material, said receptacles being interconnected along a common edge, each receptacle having a substantially semi-cylindrical side wall, a substantially semi-circular end wall at opposite ends of each said side wall, each end wall of at least one receptacle being integral with said side wall and includes on end rib extending inwardly from and normal to said side wall, said end wall having a portion sloping outwardly from said end rib toward the free edge of said end wall whereby to retain an exact quantity of said coins when stacked side-by-side in close fit across said side walls and transverse to the axial plane of said cylindrical holder, said side walls of said receptacles forming a closed hollow cylindrical compartment when said receptacles are folded together from said common edge and secured in juxtaposition.

4,183,433
FOLDABLE CONTAINER WITH AT LEAST ONE RECEPTACLE FOR ELONGATED ARTICLES

Klaus Kroner, Ahornweg, Freudental, Fed. Rep. of Germany

Filed Oct. 5, 1976, Ser. No. 729,706
Claims priority, application Fed. Rep. of Germany, Feb. 5, 1976, 2604413
Int. Cl.[2] B65D *85/10*
U.S. Cl. 206—257 7 Claims



1. In a container for small elongated articles, a generally parallelepipedal box-like receptacle having an open top, end walls, a planar bottom, and side walls upstanding from and

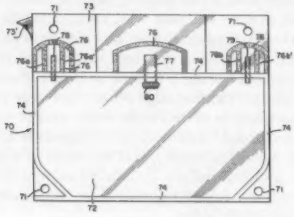
merging into said bottom in surfaces each arcuately curved about respective first and second laterally-spaced pivot axes, first and second substantially identical covers each including a side wall and first and second end edges upstanding therefrom, and mounting means mounting said covers on said receptacle along said spaced axes, for pivotal movement about respective ones of said axes, from a first position wherein the side walls of said covers are essentially coplanar, to a second position wherein the side walls of said covers are disposed in generally parallel spaced apart planes and enclose said receptacle, the side walls of each said cover, when in said second position, extending downwardly beyond their respective pivot axes to terminate in a straight edge engaging said planar bottom and camming said receptacle to erect position, by and in response to pivoting of said covers from their second to their first position; said pivoting means including a bearing for each cover; each said pivoting means being equally distant from the bottom surface and the side surface of the receptacle; the internal surface of each cover in the folded state of the container abutting against the side surface of the receptacle associated with its internal surface.

4,183,434

PEELABLE SEAL

William E. R. Watt, Barto, Pa., assignor to Pharmachem Corporation, Bethlehem, Pa.

Filed Sep. 2, 1977, Ser. No. 830,051
Int. Cl.[2] A61B *19/02*
U.S. Cl. 206—438 **11 Claims**



1. In a bag for storing blood components consisting of a sterilizable, flexible closed polyolefin container having at least two inlets at the top thereof forming part of said closed container, the improvement which comprises, a bag-like protective closure hermetically enclosing each of said inlets, said protective closure being integral with said bag and formed by heat-sealing under combined application of heat and pressure a portion of at least two polyolefin film members having at least one oxidized surface therebetween so as to form a seal that is peelable to expose each of said inlets.

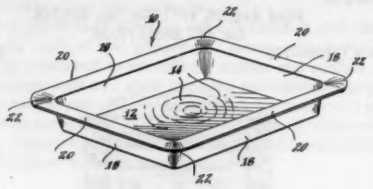
4,183,435

POLYMERIC MULTIPLE-LAYER SHEET MATERIAL

Kenneth P. Thompson, Canton, N.C., and Richard C. Ihde, Strongsville, Ohio, assignors to Champion International Corporation, Stamford, Conn.

Filed Aug. 24, 1978, Ser. No. 936,611
Int. Cl.[2] B65D *1/34*; C08F *43/08*
U.S. Cl. 206—557 **10 Claims**

1. A multiple-layer sheet material from which containers adapted to heat food in microwave ovens may be erected, said sheet material comprising a core layer of foamed, high density polymeric material selected from the group consisting of high density polyethylene and polypropylene, and surface layers on



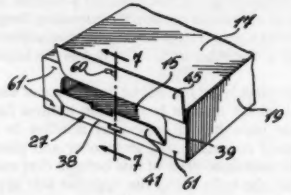
both sides of said core layer, each of said surface layers being a relatively thin layer of polyethylene terephthalate.

4,183,436

STOCK OR SHIPPING CONTAINER

Bernard Engelhardt, and Dennis E. McKay, both of Toronto, Canada, assignors to Bernard Engelhardt, Toronto, Canada

Filed Mar. 17, 1978, Ser. No. 887,807
Int. Cl.[2] B65D *5/54, 17/06, 17/24*
U.S. Cl. 206—622 **10 Claims**



1. A blank of foldable sheet material for forming a container cut and creased to provide elongated panels in series, each connected to its adjacent panel by a crease and including:

a first side-forming panel,

a floor panel having a wall-forming panel at each end hinged to it by a crease,

a side panel,

a roof panel having a wall-forming panel hinged to it by a crease,

a second side-forming panel,

at one end of the blank, a door forming structure, comprising,

one of said wall-forming panels of said floor panel being provided with a hinging crease parallel to and spaced from its crease connection to the floor panel and a cut extending from each end of said hinging crease towards the edge of one wall-forming panel then parallel to said hinging crease, said hinging crease and said cut defining an inside access door occupying a major area of the one wall-forming panel carried by said floor and hingeable about the hinging crease bordered by a continuous supporting frame,

and a second wall-forming panel connected to the roof panel by a crease and provided with a hinging crease parallel to its crease connection with the roof panel, said hinging crease extending from one edge of said second wall-forming panel to a point spaced from the opposite edge of said second wall-forming panel, and a cut extending from the outer edge of said second wall-forming panel to said point to provide an outside access door occupying a major area of the second wall-forming panel bordered on two sides by a supporting frame,

all of the wall-forming panels being of substantially the same height as the side-forming panels and of substantially the same width as the floor and roof panels,

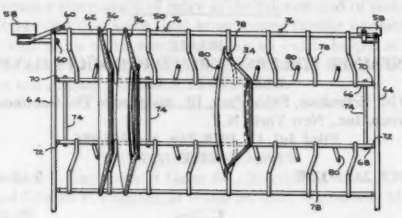
and at least one rupturable ligament formed by a skip in each cut to retain each door in its respective supporting frame.

4,183,437

RACK HOLDER ARRANGEMENT FOR DISHWARE

John G. Crawford, and Thomas E. Jenkins, both of Louisville, Ky., assignors to General Electric Company, Louisville, Ky.

Filed Dec. 14, 1977, Ser. No. 860,515
Int. Cl.[2] A47F *5/01*
U.S. Cl. 211—41 **19 Claims**



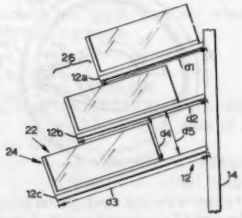
1. A dish holder arrangement comprising:
rack frame means;
a series of pairs of alternately configured dish holding elements mounted to said frame means arranged and mounted in a row to said frame means;
one of said configured pairs of said dish holding elements in said row being configured to extend generally upwardly from said frame means with the other configured pair of dish holder elements in said row extending upwardly from said frame means and outwardly in a divergent direction from each other and from said upwardly extending dish holder element pairs;
said divergent dish holder element pairs being of substantially less height above said rack frame means than said upwardly extending pairs of dish holder elements;
whereby said divergency of said diverging dish holder elements allows relatively deep dishware items to be received over said diverging dish holder elements and confined between successive pairs of said upwardly extending dish holder elements, while relatively shallower items may be supported on said rack frame means between successive pairs of said dish holder elements by engagement therewith.

4,183,438

SHELF DIVIDER

Richard Huczek, Toronto, Canada, assignor to Loblawscompanies Limited, Toronto, Canada

Filed Nov. 3, 1977, Ser. No. 848,002
Int. Cl.[2] A47F *1/00*
U.S. Cl. 211—49 D **1 Claim**



1. A shelving system comprising:
(a) a shelf support and at least two parallel shelves sloping downwardly and outwardly therefrom, one of said shelves being located above and adjacent the other, the upper shelf being of a first predetermined depth and the lower shelf being of a second and greater predetermined depth, the distance between said shelves measured in a direction perpendicular to the plan of said shelves being a predetermined distance,
(b) a pair of divider units for said lower shelf, each divider unit comprising:
(i) a longitudinal upright divider member of length equal to a substantial portion of said second predetermined depth,
(ii) a slide member connected to the bottom of said divider member and extending at right angles thereto, said slide member extending the full length of said divider member and projecting equally on each side of said divider member and having two longitudinal edges, one on each side of said divider member, said slide member tapering in thickness from said divider member towards each said edge,
(iii) a stop member of height substantially the same as that of said divider member, said stop member being connected to the front of said divider member and to the front of said slide member and extending at right angles to each on each side of said divider member, to the same extent as said slide member,
(iv) the height of said divider member and stop member being at least equal to 75 percent of said predetermined distance, and the distance by which each stop member projects laterally from its associated divider member being between ¼ inch and two inches,
(v) said stop member, divider member and slide member being an integral unit formed of transparent plastic,
(vi) each divider member having a vertical hole therein, said hole extending from the bottom of said divider member upwardly above the level of the top of said slide member and being of diameter greater than the thickness of said divider member, said hole being located a short distance rearwardly of said stop member,
(c) fastening means securing said divider units to said lower shelf with the respective stop members of said divider units being directed toward each other and with an upright gap of substantial width between said respective stop members, so that a hand may be inserted therethrough to place articles on said lower shelf between said divider members or to remove articles from said shelf from between said divider members,
(d) said fastening means including a transparent plastic peg removably friction fitted into said hole in each divider member and projecting downwardly below each divider member, said shelves having shelf holes spaced along the front thereof and said pegs being inserted into said shelf holes.

4,183,439

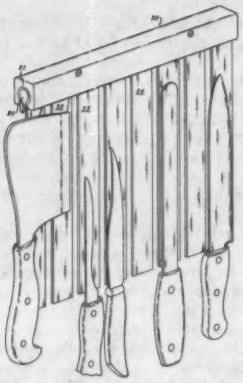
UTENSIL AND TOOL HOLDER

William W. Bell, R.P. Box 135, East Chatham, N.Y. 12060

Continuation-in-part of Ser. No. 835,446, Sep. 21, 1977, abandoned. This application Mar. 3, 1978, Ser. No. 883,295
Int. Cl.[2] A47F *7/00*
U.S. Cl. 211—60 T **2 Claims**

1. A holder of magnetically attractable articles such as utensils and tools comprising:
at least one strip of flexible magnetic means for holding said utensils and tools, each of said flexible magnetic means including two flexible magnetic strips held together by magnetic attraction and including a reinforcing material therebetween, each of said two flexible magnetic strips having substantially equal lengths along a longitudinal axis and substantially equal widths and thickness, said lengths being of greater linear dimension than said widths, with said reinforcing material extending for a predetermined distance along said longitudinal axis from one end of said flexible magnetic means; and

means for mounting said at least one strip of flexible magnetic means including a mounting bracket containing a groove therein, said groove being substantially horizontally positioned when said mounting means is properly mounted and peg means for mounting said at least one strip of flexible magnetic means on said mounting bracket



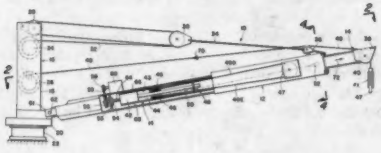
by wrapping said one end thereof, from which said reinforcing material extends, about said peg means and inserting said peg means so wrapped into said groove such that each of said flexible magnetic means extends from said mounting means with said longitudinal axis substantially vertically positioned.

4,183,440

EXTENSIBLE BOOM

Alvin H. Wilkinson, Talala, Okla., assignor to Auto Crane Company, Tulsa, Okla.

Filed Mar. 31, 1977, Ser. No. 783,154
Int. Cl.[2] B66C *23/06*
U.S. Cl. 212—55 **3 Claims**



1. In a crane having an extensible boom, comprised of at least two coaxial parts one guidably inserted into the other, a first end of the outer part hinged about a horizontal axis at the base of a rotatable pedestal, the first end of the inner part inserted and guided into the second end of said outer part, the second end of said inner part carrying a crown structure including at least two sheaves, a travelling block and hook means positioned adjacent said crown structure;

the improvement in means to control the length of said at least two-part boom, comprising;

(a) at least two inner sheaves journalled near said first end of said inner part;

(b) said outer part having a rectangular box section with at least one third sheave with its axis perpendicular to one wall of said box section, near its second end;

(c) tension means of controllable length connected between the first ends of said outer and said inner parts;

(d) means to control the length of said tension means selectively, whereby said inner part will move axially outwardly or inwardly dependent on the operation of said means to control;

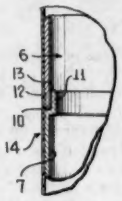
(e) winch means, including a lifting cable on a drum; said cable threaded over a first of said crown sheaves, down to said travelling block and hook, up and over the second of said crown sheaves, then inwardly parallel to said boom, around a first of said at least two inner sheaves, outwardly parallel to said boom and around said third sheave, inwardly parallel to said boom and around the second of said at least two inner sheaves, and outwardly parallel to said boom to an anchor point at said second end of said outer part.

4,183,441

CONTAINER FOR PRESSURIZED PRODUCTS HAVING A SECURITY LABEL

Paul M. Erlandson, Palos Park, Ill., assignor to The Continental Group, Inc., New York, N.Y.

Filed Jul. 12, 1978, Ser. No. 923,886
Int. Cl.[2] B65D *11/16*
U.S. Cl. 215—12 R **7 Claims**



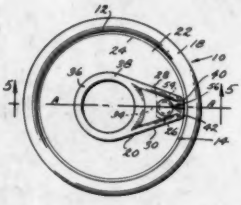
1. A new article of manufacture comprising a container for pressurized products, said container including first and second container halves joined in a generally mid-height pressure resistant peripheral seam, and means for controlling the venting of said container in the event of rupture along said seam, said vent means including a label completely encircling said container in overlying relation to said peripheral seam and being tightly secured to said container halves above and below said peripheral seam, said label being formed of a pressure resistant material.

4,183,442

CONTAINER CLOSURE HAVING PULL-TAB OPENING MEANS

Jerry F. Scharf, Havertown, Pa., and Vinson S. Potts, Cherry Hill, N.J., assignors to Crown, Cork & Seal Company, Inc., Philadelphia, Pa.

Filed Oct. 24, 1966, Ser. No. 589,618
Int. Cl.[2] B65D *41/32*
U.S. Cl. 220—271 **6 Claims**



1. A container closure having a peripheral bead for attaching the closure to the end of a container; said closure further having a flexible generally planar disc surrounded by said peripheral bead and adapted to overlie the end of the container to which it is attached, said flexible disc having a first material thickness reducing score defining a predetermined opening

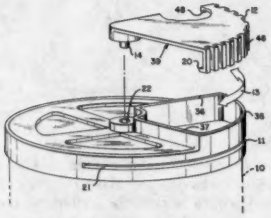
pattern and a second material thickness reducing score formed to lie radially inwardly of said first score to define a collar between said scores, said second score having two substantially straight score line portions intersecting adjacent an opening tab; an opening tab including a fulcrum portion terminating adjacent said first score and a handle portion; and means securing said fulcrum portion to said collar at a point adjacent said second score to cause the axis of said tab to lie radially of both scores; said score and tab arrangement responding to a lifting of the tab handle portion to fracture said second score and thereby permit said collar to twist out of the plane of said disc to permit a sharp angle of entry as the fulcrum end of said tab fractures said first score, said arrangement further permitting said first score to be fractured along its entire length in response to a pull on the handle portion of said tab directed away from said closure.

4,183,443

REUSABLE CUP COVER

Lawrence T. DeParales, 1 Gates Rd., Marshfield, Mass. 02050, and Edward P. Billitzer, 24 Water St. East, Weymouth, Mass. 02189

Filed Aug. 25, 1978, Ser. No. 936,798
Int. Cl.[2] A47G *19/22*
U.S. Cl. 220—90.4 **1 Claim**



1. A reusable cup cover comprising in combination with a cup,

a cup cover having a perimeter for mating with a disposable cup,

a concentric opening for receiving an expandable tip,

an arcuate slot running along the perimeter below its upper edge,

a pie shaped opening to permit drinking from the cup through the cover, having three slightly sloping surfaces upwardly in a preselected arcuate direction, and

a segment for covering the cover opening having an expandable tip for mating with the concentric hole in said cover,

a lip for slidably interfitting said arcuate slot along said cup perimeter,

a sloping undersurface to sealably mate with the edges of said cover opening,

means for latching said segment closed when the cover is placed in its closed position.

4,183,444

LID HAVING INTEGRAL HANGER

Roy L. English, and Irene F. English, both of 2733 SE. 31st, Portland, Oreg. 97202

Filed Jul. 31, 1978, Ser. No. 929,810
Int. Cl.[2] B65D *35/44, 43/00, 51/00*
U.S. Cl. 220—200 **12 Claims**

1. A removable lid for a food and drink cup, comprising:

(a) cover means for covering the open top of the cup;

(b) annular retaining rim means joined to the periphery of said cover means for circumscribing the top of the cup and retaining said lid in position thereon;

(c) hanger means integral with said retaining rim means for engaging an opening defined in a food container; and

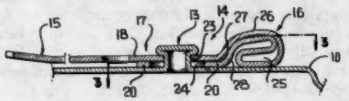
(d) a food container defining hole means therein, said hole means arranged for cooperating with said hanger means so that said food container is carried by said lid.

4,183,445

TETHERED TAB WITH CHANGEABLE BEND LINE

George D. LaCross, Burbank, Ill., assignor to The Continental Group, Inc., New York, N.Y.

Filed Nov. 9, 1978, Ser. No. 959,116
Int. Cl.[2] B65D *41/32*
U.S. Cl. 220—273 **16 Claims**



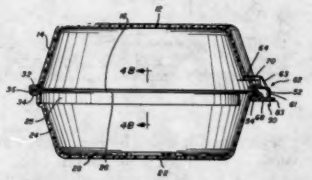
1. A pull tab for an easy opening container, said pull tab comprising a lifting portion, a force applying portion and an intermediate attaching portion, said tab being in the form of an elongated strip partially reversely folded upon itself in said force applying portion with said attaching portion and said force applying portion being of a double thickness, and aligned securing element receiving openings in said double thickness attaching portion, one of said openings corresponding in cross section to an intended fastener, and the other of said openings being elongated in the direction of tab length.

4,183,446

FOOD CONTAINER WITH INTEGRAL DISH AND COVER

Paul Davis, Swampscott, Mass., assignor to Sweetheart Plastics, Inc., Wilmington, Mass.

Continuation-in-part of Ser. No. 887,298, Mar. 15, 1978, abandoned, which is a continuation of Ser. No. 764,033, Jan. 31, 1977, abandoned. This application Jun. 6, 1978, Ser. No. 913,249
Int. Cl.[2] B65D *41/16;* A47J *41/00;* B65D *1/00, 5/48*
U.S. Cl. 220—306 **5 Claims**



1. A deformable container comprising a bottom dish and a top cover having a connecting hinge at one end and a latching means having a male portion and a female portion at the other end, wherein:

said bottom dish comprises a base wall and side walls out-

wardly inclined from said base wall and terminating at their edges remote from said base wall in a flared first rim; at one end of said dish said first rim being integrally molded to said hinge and at the opposite end said first rim terminating at and being integrally molded to said male portion of said latching means;

said male portion of said latching means comprises a central segment lying in a plane substantially parallel to said base and displaced above the level of said first rim in a direction away from said base; said central segment being connected to the top of the side wall of the bottom dish; and supporting segments interconnecting said central segment and said first rim on each side of said central segment; said supporting segments also being connected to the top edge of said side wall; whereby the side wall, central segment, supporting segments and first rim form a relatively rigid structure free of hinge-like connections between the side wall and the male portion of the latching means;

said top cover comprises a top wall and side walls outwardly inclined from said top wall and terminating in a flared second rim; at one end of said cover said second rim being integrally molded to said hinge and at the opposite end said second rim terminating at and being integrally molded to said female portion of said latching means;

said female portion of said latching means comprises

an outwardly protruding chamber formed at least in part in the cover side wall and disposed on the side of said second rim toward said top wall; a shelf defining the end of the protruding chamber nearer the top wall and connected to the cover side wall, said shelf being substantially parallel to said top wall;

an inwardly protruding indentation formed in said chamber, said indentation angling from the outer edge of said chamber toward the inner portion of said shelf;

and a U-shaped slot cut into said chamber with the outer circumference of the U cut into said shelf and the inner circumference of the U cut into the inwardly protruding indentation; said inner and outer circumferences of the slot being displaced from one another in a direction parallel to the plane of the shelf whereby the slot may be formed by a cutting tool moving perpendicular to the plane of said shelf;

and said hinge, said botton dish, said top cover, and said male and female portions of said latching means being constructed and arranged so that as said cover is rotated about said hinge toward the closed position said central segment rides on said inwardly sloping indentation until it snaps into said slot.

4,183,447

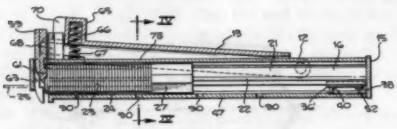
DRAPERY PIN PACKAGING AND DISPENSING DEVICE

Abraham Jacobson, 7900 Garner St., Long Beach, Calif. 90808

Filed May 26, 1978, Ser. No. 909,825

Int. Cl.[2] B65G 59/08

U.S. Cl. 221—232 **10 Claims**



1. In a device for dispensing drapery pins including a casing for accommodating a stack of pins in side-by-side relationship, a cover member having pin receiving means thereon for accommodating a single pin, said cover member having pin urging means thereon for urging the single pin away from said stack, the improvement which comprises:

said cover member is an elongated shroud pivotally mounted at one end to said casing, said pin receiving means including a flange plate fixedly secured to said shroud having an outer configuration substantially the same as the inner configuration of said pins for receiving a leading one of said pins thereon, said flange plate being guided in movement in a direction normal to the longitudinal axis of said shroud when said shroud is pivoted on said casing, said pin urging means including a rack having said stack mounted thereon and a spring biased plunger on said rack abutting against the terminal end of said stack to thereby urge said pins toward said flange plate whereby pivotal movement of said shroud urges the point of said pin carried by said flange plate out of said device for insertion into a drapery.

4,183,448

MOULDING OF SYNTHETIC PLASTICS PRODUCTS

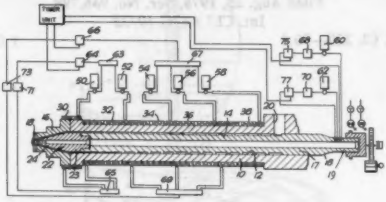
David D. Nash, Brownhills, Great Britain, assignor to Durapipe Limited, Staffordshire, England

Filed Dec. 9, 1976, Ser. No. 749,092

Claims priority, application United Kingdom, Apr. 23, 1976, 16700/76

Int. Cl.[2] B29F 3/06, 3/08

U.S. Cl. 222—63 **6 Claims**



1. Apparatus for moulding an article in plastics material comprising a cylinder having an axial bore, the cylinder being fitted at one end with a nozzle, the cylinder having an axial passage at its opposite end, a screw disposed axially within the cylinder and having its screw crests cooperating closely with the bore of the cylinder, a part coaxial with the screw and connected with the end of the screw remote from the nozzle, said part coaxial with the screw extending sealingly through said axial passage at the end of the cylinder remote from the nozzle, driving means for rotating the screw being connected with said part, means mounting the screw for rotation and axial movement within the cylinder, the apparatus including means for heating said cylinder, the cylinder further including an inlet passage, for the supply of plastics material to the cylinder, which passage enters the cylinder adjacent the rear end of the screw, the apparatus including means operable to ensure that plastics material can be delivered through the screw out of said nozzle at least principally by rotation of the screw, the apparatus including control means for controlling the axial position of the screw in the cylinder during rotation thereof, the nozzle having an internal passage which tapers toward the tip of the nozzle and the screw, at its end nearer the nozzle, being provided with a tapering tip shaped to conform closely with the internal passage through the nozzle, the screw tip, in the forwardmost position of the screw, sealing off the nozzle to prevent plastics material from the cylinder from issuing from the nozzle, biasing means provided for biasing the screw axially forwards and said control means being operable to control the bias exerted by said biasing means in such a way to prevent rearward movement of the screw beyond a position spaced rearwardly of its forwardmost position to an extent which is small in relation to the distance from the nozzle tip to said inlet passage, so that only a narrow annular passage is defined between the tapering tip of the screw and the opposing internal surface of the nozzle, wherein said control means includes at least one sensing device for sensing when the screw has moved rearwardly away from the nozzle past a predetermined position spaced rearwardly from the forwardmost position of the

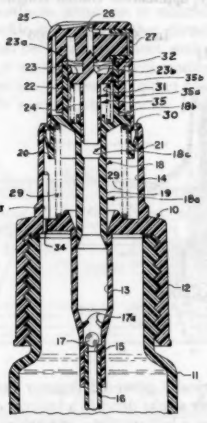
screw and wherein said biasing means is operable in a first state to apply a first predetermined biasing force biasing the screw axially forwards towards the nozzle and in a second state to apply a second, lesser biasing force biasing the screw axially forwards, said sensing device being arranged to cause said biasing means to change from its said second state to its said first state upon sensing that the screw has moved rearwardly past said predetermined position, thereby urging the screw forwards again, said sensing means being arranged to cause said biasing means to change from its first state to its second state on sensing that the screw has moved forwards past said predetermined position, whereby, in operation of the apparatus the screw may be caused to move backwards to said predetermined position under the action of a melt pressure distribution over the screw tip and along the screw which is sufficient to overcome second biasing force and after said predetermined position may be caused to move forwards past said predetermined position by said first biasing force, where said pressure distribution is not sufficient to overcome said first biasing force, so that while the apparatus remains in one condition the screw oscillates slightly about said predetermined position as the mean position, the apparatus including a plurality of sensing devices each arranged to sense when the screw has moved rearwardly past a respective predetermined position spaced rearwardly from the forwardmost position of the screw, the apparatus including timing means whereby each sensing means is rendered effective to control the axial position of the screw, in the manner set out with respect to the first mentioned sensing device, only during a respective predetermined period, so that during each said period the screw oscillates about the respective predetermined position defined by the respective sensing device.

4,183,449

MANUALLY OPERATED MINIATURE ATOMIZER

William S. Blake, Miami Lakes, Fla., assignor to The AFA Corporation, Miami Lakes, Fla.

Filed Jan. 9, 1978, Ser. No. 868,084
Int. Cl.² B05B 9/04
U.S. Cl. 222—321 **14 Claims**



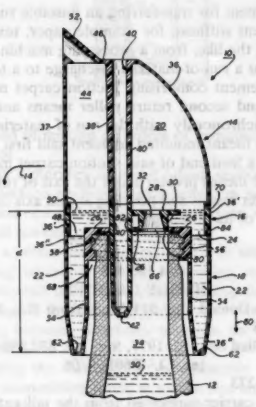
1. Pressure controlled sprayer apparatus comprising:
a container for dispensing fluid;
a dispensing outlet;
component means comprising a closure body connected to the container, a downwardly disposed third cylinder, vent means, and a valve seat in the lower end of the third cylinder wherein check valve means is loosely retained in place in the lower end of the third cylinder;
a dip tube extending into the container and connected to the third cylinder;
and further comprising first and second tubular members, said first member having first and second ends with a first tubular piston formed on said first end and first and second cylinders of different cross section formed on said second end, said second member having first and second ends with a third tubular piston and a fourth piston formed, respectively, on said first and second ends, said third tubular piston being inserted in and slidable in said first cylinder, said first tubular piston being slidable in said third cylinder;
a second tubular piston formed on the second end of said first tubular piston and being slidable in said fourth cylinder;
actuator means for actuating the first and second tubular members so as to dispense the fluid from the container through the dispensing outlet, valve means associated with said third cylinder and with said third tubular piston and providing a variable volume chamber including portions at least of said second and third cylinders and the interior space of said first and second tubular members, and resilient means biasing said first tubular piston to a predetermined position in said third cylinder, said predetermined position providing substantially maximum volume of said chamber.

4,183,450

METERING DEVICE

Neil H. Downing, 52 S. Pine St., Katonah, N.Y. 10536; Edward M. Brown, Livingston, and Edward J. Towns, Convent Station, both of N.J., assignors to Neil Hugh Downing, Katonah, N.Y.

Filed Oct. 6, 1976, Ser. No. 729,995
Int. Cl.² G01F 11/26
U.S. Cl. 222—455 **8 Claims**



1. A device for measuring and pouring a given volume of a heavier-than-air fluid from a fluid source comprising:
a fluid storage chamber adapted to be connected to said source for receiving from said source by gravity a volume of said fluid greater in value than said given volume through a first opening in said storage chamber when said storage chamber is in a first inverted orientation,
a fluid volume measuring chamber smaller than, secured to, and in fluid communication with said storage chamber for receiving fluid stored in said storage chamber when said chambers are placed in a second upright orientation, said first opening having a predetermined spaced relationship with respect to said measuring chamber for determining said given volume by overflowing fluid in excess of said

given volume from said chambers when said chambers are in said second upright orientation, said chambers having a common fluid port for transferring said fluid from said storage chamber to said measuring chamber, said common fluid port having a first transverse area, said opening having a second transverse area smaller than said first area for permitting said given volume of fluid to flow into said measuring chamber,

vent conduit means positioned in direct fluid isolation from each said chambers and secured to at least one of said chambers for venting said source with ambient air when said storage chamber is connected to said source, and

means in fluid communication with said measuring chamber for receiving and pouring said given volume to the ambient when said chambers are in said inverted orientation.

4,183,451

EQUIPMENT FOR TRANSFERRING AN UNSTABLE RUN OF MATERIAL FROM A PROCESSING MACHINE TO A TENTER CHAIN

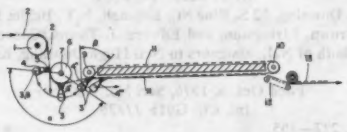
Fritz Gageur, Lindau-Bodolz, Fed. Rep. of Germany, assignor to Lindauer Dornier Gesellschaft mbH, Fed. Rep. of Germany

This application Aug. 10, 1978, Ser. No. 932,619

Claims priority, application Fed. Rep. of Germany, Oct. 14, 1977, 2746174

Int. Cl.[2] B65H *17/28, 17/32*

U.S. Cl. 226—91 **4 Claims**



1. In equipment for transferring an unstable run of material lacking inherent stiffness, for example paper, textiles, poured materials, and the like, from a processing machine including a return roller at a run-of-material discharge to a tenter,

the improvement comprising suction carpet means guided by first and second return roller means and adapted to move synchronously with the run of material,

guide roller means mounted adjacent said first return roller means at a feed end of said suction carpet means, and

air-squeegee means pivotal about the axis of rotation of said guide roller means and pointing at said axis during at least a portion of its pivoting motion.

4,183,452

BUGGY CARRIER

Walter F. MacDonald, Jr., 511 Menauhant Rd., E. Falmouth, Mass. 02536

Filed Sep. 12, 1977, Ser. No. 832,390

Int. Cl.[2] B60R *9/06*

U.S. Cl. 224—273 **9 Claims**

1. A buggy carrier supported from the tail gate of a horse trailer, comprising;

a pair of support braces each of elongated shape having a length greater than the height of the tail gate to extend at least partially thereabove and each having means disposed along the length spaced from the ends to support the brace in a generally vertical direction from the tail gate with the braces extending substantially normal to the top edge defining the tail gate,

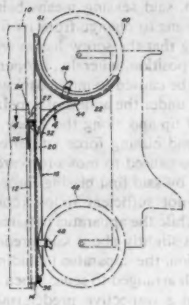
said means to support each brace including a bracket defining an opening for fitting the top end of the tail gate of the trailer,

means extending from each brace for receiving a wheel of the buggy so as to support the wheel in an upright position with a portion of the buggy supported above the tail gate top edge,

securing means at the bottom of the tail gate for securing the bottom end of the support brace against the tail gate,

and means for fastening the buggy to the braces,

said means for receiving a wheel including a U-channel member having an arcuate shape corresponding substantially to the shape of the wheel and extending substantially tangentially to the elongated brace in a vertical direction,



said means for fastening the buggy including at least one strap means associated with the U-channel member extending about the U-channel member and the wheel mounted therein and disposed in the U-channel member for holding the wheel securely in the U-channel member.

4,183,453

ELECTRONICALLY OPERATED PORTABLE FASTENER DRIVING TOOL

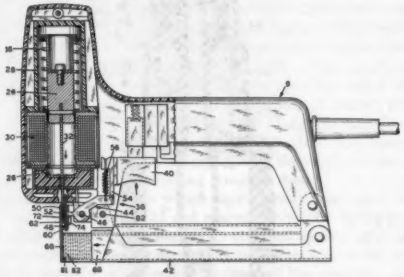
Edward E. Barrett, Massapequa Park; Albert Lensky, New York; Paul Olesen, Bellmore; Christian F. Becker, Larchmont; Morris Pinczewski, New York; Wilfredo Febre, Rego Park, and Steven Hahn, East Hampton, all of N.Y., assignors to Swingline, Inc., Long Island City, N.Y.

Filed Feb. 23, 1978, Ser. No. 880,846

Claims priority, application United Kingdom, Apr. 10, 1977, 41280/77

Int. Cl.[2] B25C *5/06*

U.S. Cl. 227—131 **12 Claims**



1. In an electrically powered fastener driving tool which provides a multiple stroke drive to a fastener each time the tool is actuated having a hollow body comprising:

(a) an elongated head portion housing an armature assembly which includes:

(i) a solenoid,

(ii) a plunger which fits within and slides axially of said solenoid, and

(iii) a driver blade for driving fasteners connected to said plunger;

(b) a handle portion projecting rearwardly from said head portion having trigger means for actuating the tool;

(c) a magazine portion for holding a plurality of fasteners and for advancing said fasteners in position for driving engagement with said driver blade, said magazine portion connected to said head portion;

(d) an electronic trigger control circuit for supplying the solenoid with a predetermined plurality of unidirectional current pulses each time the trigger means is actuated for impelling the driver blade to provide a like number of driving strokes to a single fastener in response to each actuation of the trigger means; and

(e) means for preventing more than one fastener from being driven during a single actuation of the tool by preventing the advancement of a second fastener into the axial path of the driver blade while a first fastener is being driven with a plurality of strokes of the driver blade.

4,183,454

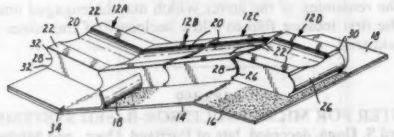
WELDING BACKUP EMPLOYING A TRAIN OF KNUCKLE-JOINT TILES

John B. Snell, Lake Elmo, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed May 12, 1978, Ser. No. 905,153

Int. Cl.[2] B23K *9/02*

U.S. Cl. 228—50 **17 Claims**



1. In a welding backup comprising an elongated, flexible, heat-resistant backing to which is adhered a train of uniform, contiguous, rigid tiles less than 10 cm in length and 3 cm in thickness and capable of supporting molten metal, the improvement comprising:

(a) the contiguous ends of the tiles have knuckle joints comprising round mating surfaces on substantially a common center or axis through substantially the center of a tile,

(b) said round surfaces terminate in matching stops which limit the knuckle motion in either direction to 5 to 20 degrees beyond collinear alignment, and

(c) the backing is extensible and will readily buckle so that the backup can be conformed to either convex or concave surfaces while keeping the knuckle joints substantially tight.

4,183,455

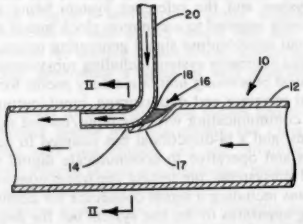
LANCED TUBE JOINT PROCESS

William D. Reynolds, Morrison, Tenn., assignor to Carrier Corporation, Syracuse, N.Y.

Filed Dec. 21, 1977, Ser. No. 862,717

Int. Cl.[2] B23K *31/02*

U.S. Cl. 228—170 **7 Claims**



1. A method of joining a small diameter tube to a large diameter tube which comprises the steps of:

forming an indentation in the wall of the large diameter tube such that a portion of the wall is sheared from the remainder of the tube wall leaving an indentation portion inclined inwardly toward the axis of the large diameter tube and leading to an opening through the wall, said opening being defined by the indentation portion of the wall and the remaining nondeformed wall, said indentation portion being angled such that the fluid flow in the large diameter tube impinges the indented portion of the tube wall away from the opening and is forced inwardly and around said opening by the indentation portion;

inserting the small diameter tube through the opening in the wall such that the portion of the small diameter tube extending through the opening discharges fluid flowing therethrough in a direction generally parallel to the axis of the large diameter tube; and

affixing the small diameter tube to the large diameter tube.

4,183,456

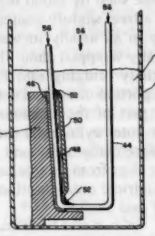
METHOD OF FABRICATING LIQUID COOLED GAS TURBINE COMPONENTS

William F. Schilling, Schenectady; Adrian M. Beltran, Ballston Lake, and Myron C. Muth, Amsterdam, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 785,303, Apr. 6, 1977, abandoned. This application Jul. 17, 1978, Ser. No. 924,981

Int. Cl.[2] B23K *19/00*

U.S. Cl. 228—175 **20 Claims**



12. A method of making an article of manufacture comprising the steps of:

(a) disposing a plurality of metal tubing sections at a preselected interface portion of said article in such a manner that at least one end of each tubing section extends external to said portion,

(b) placing a preformed cladding over both said portion and the tubing whereby the said extending tube ends also project beyond the cladding and affixing the cladding to said portion to form an assembly,

(c) masking exposed interfaces between the cladding and said portion,

(d) subjecting the assembly to hot isostatic pressure in a pressure transmitting liquid at a sufficient temperature and pressure, while maintaining said tubing sections open to said pressure such that the same pressure exist inside and outside of said sections preventing said section from collapsing, and whereby the tubing and the cladding are metallurgically bonded to the article.

4,183,457

SHRINK TAPE CLOSURE

William A. Loughley, Twinsburg, and Lewis L. Otterson, Chagrin Falls, both of Ohio, assignors to Weatherchem Corporation, Twinsburg, Ohio

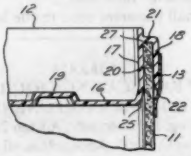
Filed Aug. 9, 1978, Ser. No. 932,209

Int. Cl.[2] B65D *3/10, 5/00, 13/00*

U.S. Cl. 229—5.5 **8 Claims**

1. A canister assembly comprising a thin-walled cylindrical

shell and a cap forming a closure at one end of the shell, said cap having a central disc portion extending across a major portion of the end face of the shell and a pair of concentrically arranged inner and outer skirts, said central disc portion having a major portion defining a plane, said skirts being integrally formed on the circumference of said disc portion and extending axially rearwardly of said central disc portion, a forwardmost edge of said outer skirt being axially spaced rearwardly from said disc plane, the inner surface of said outer skirt and the outer surface of said inner skirt together forming an annular channel in which an end of the shell is received, said skirts being constructed and arranged such that substantially all of the area of said inner and outer skirt surfaces contact said shell at respective points axially spaced from said disc plane



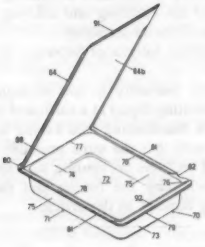
whereby said inner and outer skirts are relatively free of radial restriction by said central disc portion so that said skirts are capable of accommodating expected dimensional variations in the actual size of the shell by radial deformation thereof, said outer skirt having a free, slightly conical configuration flaring radially outwardly in an axially forward direction, a sealing tape circumferentially wrapped about the outer surface of said outer skirt and axially bridging said forwardmost edge in a manner whereby a portion of its axial extent contacts said outer skirt and a major part of the remaining portion of its axial extent contacts the outer cylindrical surface of said shell, said tape being circumferentially tensioned a sufficient degree to constrict said outer skirt from its free conical configuration to a substantially cylindrical configuration against the outer cylindrical surface of said shell.

4,183,458

TRAY HAVING HINGED, RECLOSEABLE LID WITH LOCKING FEATURE

George L. Meyers, Menasha, Wis., assignor to American Can Company, Greenwich, Conn.

Filed Jan. 18, 1978, Ser. No. 870,597
Int. Cl.[2] B65D *5/66, 43/16*
U.S. Cl. 229—44 R **10 Claims**



1. A container comprising:

(a) a formed plastic tray having a bottom and sides and peripheral edges defining the top opening in said tray, said peripheral edges including front and back edges and a pair of lateral side edges, and outwardly extending flanges affixed to and extending outwardly from the front, back and side peripheral edges of said tray,

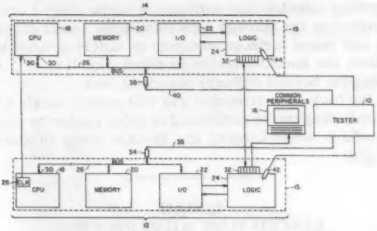
(b) a substantially flat paperboard cover having outer and inner sides, the inner side of said cover being adhered to said peripheral flanges of said tray in position covering the open top thereof, said cover having score lines cut partially through the inner side of said cover at positions inwardly adjacent to the front edge of said tray and adjacent to the lateral side edges of said tray and a hinge line formed therein adjacent to the back edge of said tray, said cover additionally having a score line cut partially through the outer side of said cover substantially parallel to and spaced outwardly of the cut score line in the inner side of said cover at the front edge of said tray, said outer side cut score line extending substantially the length of the front edge of said tray and intersecting said inner cut score line at its ends, said cover being adhered to said front flange only at the area of said cover between said outer side cut score line and the edge of said cover, whereby when said cover is pulled upwardly from the tray by a user, the cover will split at the areas of adhesion between said cover and the flanges of said tray along the lateral sides thereof and between said outer and inner side cut score lines at the front edge of said tray, and will hingedly open about its hinge line at the back edge of said tray, the splitting of the cover between said outer and inner cut score lines leaving a first split thickness locking flap remaining on the tray at the front edge thereof with a second overlapping split thickness locking flap at the front of the remaining of the cover which may be engaged under the first locking flap to allow reclosure of the cover on said tray.

4,183,459

TESTER FOR MICROPROCESSOR-BASED SYSTEMS

Edward S. Donn, deceased, late of Portland, Oreg., and Michael D. Lippman, San Jose, Calif., assignors to Fluke Trendar Corporation, Mountain View, Calif.

Filed Apr. 24, 1978, Ser. No. 899,756
Int. Cl.[2] G06F *11/00*
U.S. Cl. 235—302 **14 Claims**



1. An apparatus for testing a substantially self-contained programmed computer system, designated a test system, for identity of operation with a second substantially self-contained programmed computer system, designated a reference system, the test system and the reference system being adapted to synchronously respond to a common clock means and a common external input/output signal generating means, each said programmed computer system including subsystems, namely a digital central processing unit, a memory means for a resident operational program and data storage, input/output interface means for communicating with the input/output signal generating means, and a bi-directional bus coupled to each of said subsystems and operative to communicate digital signals between said subsystems, the testing apparatus comprising:

first means including a signal connector for connecting said testing apparatus to the test system bus for detecting said digital signals thereon;

second means including a signal connector for connecting said testing apparatus to the reference system bus for detecting said digital signals thereon;

means coupled to said first bus signals detecting means and to second bus signals detecting means, corresponding signals of said first and second bus signals detecting means being paired for comparing test system bus signals and reference system bus signals synchronously to detect non-coincidence therebetween;

means for simultaneously terminating operation of the test system and of the reference system upon detection of said non-coincidence; and

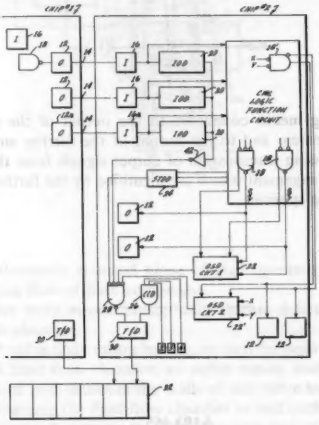
means for indicating the nature of said non-coincidence.

4,183,460

IN-SITU TEST AND DIAGNOSTIC CIRCUITRY AND METHOD FOR CML CHIPS

Raymond C. Yuen, Poway; Mark A. Menezes, Rancho Bernardo, both of Calif., and Herbert Stopper, Orchard Lake, Mich., assignors to Burroughs Corporation, Detroit, Mich.

Filed Dec. 23, 1977, Ser. No. 863,696
Int. Cl.[2] G01R *31/28*; G06F *11/00*
U.S. Cl. 235—302 **23 Claims**



1. In an integrated circuit chip having logic function circuitry for performing a function in a data processing system, having a signature correlated to its logic function circuitry, having a class code means encoded thereon which in response to signals applied from an external source will generate a pattern of binary signals identifying the type of chip involved, and further having a plurality of input and output means for connecting said chip to external devices, comprising:

fault sensing and test circuit connected to a selected one of said output means,

said sensing and testing circuitry including,

means connected to said input means and said selected output means for sensing a fault at said input means and generating a signal at said selected output means;

means connected to said output means and said selected output means for sensing a fault at the unselected output means and generating a signal at said selected output means;

means connected to said class code means and to said selected output means for determining the class of chip containing said fault sensing and test circuitry and for generating a signal at said selected output means when the proper class of chip is selected; and

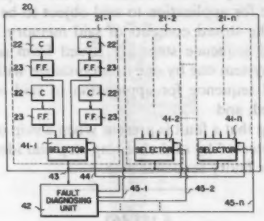
means connected to said logic function circuitry and to said selected output means responsive to signals applied to said selected output means for recognizing the signature of said chip thus detecting any fault in the logic function circuitry of said chip.

4,183,461

FAULT-DIAGNOSING METHOD FOR AN ELECTRONIC COMPUTER

Fumitaka Sato, Oume, Japan, assignor to Tokyo Shibaura Electric Co., Ltd., Japan

Filed Mar. 14, 1978, Ser. No. 886,901
Claims priority, application Japan, Mar. 14, 1977, 52-27109
Int. Cl.[2] G06F *11/06*
U.S. Cl. 235—304 **10 Claims**



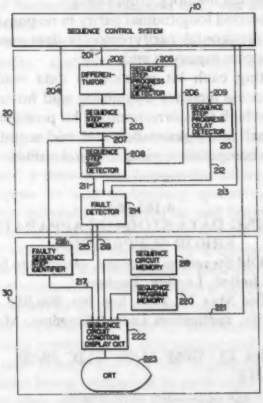
1. A fault-diagnosing method for an electronic computer system having a central processing unit including a plurality of packages each having sequential circuits which comprises the steps of diagnosing a fault in any of the sequential circuits by using the fault-diagnosing circuits provided in the respective packages; providing a common exclusive fault-diagnosing bus to which the output terminals of the fault-diagnosing circuits are connected; and supplying the fault-diagnosing bus with signals denoting the state of the sequential circuits which have been selected by a fault-diagnosing unit, wherein the fault-diagnosing unit receives the signals denoting the state of the sequential circuits in the selected one of the packages through the exclusive fault-diagnosing bus so as to diagnose a fault which happens to occur in said selected package.

4,183,462

FAULT DIAGNOSIS APPARATUS AND METHOD FOR SEQUENCE CONTROL SYSTEM

Keiji Hideshima, Yamato; Naoki Sasaki, Zama, and Masaoki Takaki, Hitachi, all of Japan, assignors to Hitachi, Ltd. and Nissan Motor Company, Limited, both of, Japan

Filed Feb. 15, 1978, Ser. No. 878,017
Claims priority, application Japan, Feb. 25, 1977, 52-19173
Int. Cl.[2] G06F *11/00*
U.S. Cl. 235—304 **12 Claims**



1. A method for diagnosing a fault in a sequence control

system controlling an object by applying a plurality of predetermined sequence steps in accordance with a predetermined sequence, said method comprising the steps of:

preparing memory means having a plurality of addresses or bits corresponding to the respective ones of said plurality of predetermined sequence steps;

storing the issued sequence step in the corresponding one of said addresses or bits of said memory means every time said sequence steps are issued from said sequence control system one by one in accordance with said predetermined sequence for application to said object to be controlled;

checking the stored contents of said memory means every time said sequence steps are issued from said sequence control system one by one in accordance with said predetermined sequence for application to said objects to be controlled; and

determining that a fault is present when a skip of a sequence step is detected by said checking step and identifying said particular faulty sequence step.

4,183,463

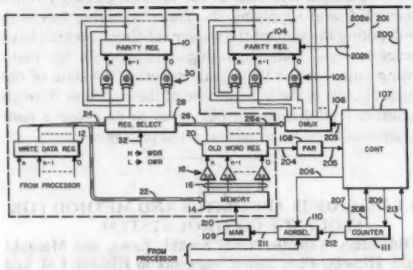
RAM ERROR CORRECTION USING TWO DIMENSIONAL PARITY CHECKING

Gary H. Kemmetmueller, Rogers, Minn., assignor to Sperry Rand Corporation, New York, N.Y.

Filed Jul. 31, 1978, Ser. No. 929,768

Int. Cl.[2] **G06F** *11/10;* **G11C** *29/00*

U.S. Cl. 235—312 **5 Claims**



1. In a computer with a random access memory having first longitudinal parity generation and horizontal parity checking, the improved method of correcting errors in data read from said random access memory comprising:

computing second longitudinal parity in response to notification of a horizontal parity error in data read from said random access memory; and

complementing each bit position in data read from said random access memory containing said horizontal parity error for which the corresponding bit position of said first longitudinal parity generation and said second longitudinal parity computation yield unequal values.

4,183,464

HASH-CODING DATA STORAGE APPARATUS WITH ERROR SUPPRESSION

Edward Babb, Old Stevenage, England, assignor to International Computers Limited, London, England

Filed May 15, 1978, Ser. No. 906,054

Claims priority, application United Kingdom, May 25, 1977, 21973/77

Int. Cl.[2] **G06F** *11/00;* **G11C** *29/00*

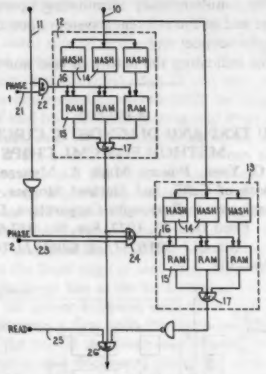
U.S. Cl. 235—312 **5 Claims**

1. A data storage apparatus comprising:

(a) a hash-coding storage arrangement of a type which produces spurious output signals;

(b) checking means connected to the output of said storage arrangement for detecting said spurious output signals;

(c) a further store, connected to the output of said checking means, for storing signals identifying the detected spurious output signals; and



(d) gating means connected to the output of the storage arrangement and to the output of the further store, for suppressing transmission of output signals from the storage arrangement which are identified by the further store as being spurious.

4,183,465

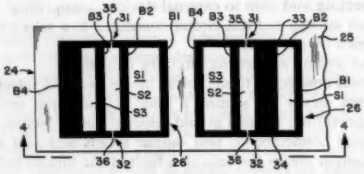
RECORD AND PRINTING MEMBER FOR MAKING THE RECORD

Bruce W. Dobras, Dayton, Ohio, assignor to Monarch Marking Systems, Inc., Dayton, Ohio

Filed Jan. 2, 1975, Ser. No. 538,226

Int. Cl.[2] **G06K** *19/06, 7/10;* **B41F** *33/00;* **G06K** *9/00*

U.S. Cl. 235—494 **4 Claims**



1. A record, comprising:

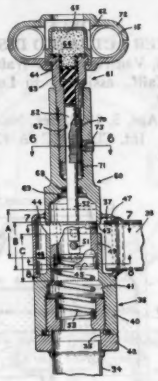
a record member, and

a machine readable character printed on the record member and including at least one line and a printability gauge having an intra-character gap across the line, the optical reflectivity of the character differing from the optical reflectivity of the record adjacent the character, the gap having a width which is substantially constant and substantially less than the width of the line.

4,183,466
THERMALLY ACTUATED PHASE CHANGE OPERATED CONTROL VALVE FOR HEAT PUMP SYSTEMS

Richard C. Dreibelbis, Fair Lawn, N.J., assignor to Emerson Electric Co. (H & H Precision Products), Saint Louis, Mo.

Filed Jun. 30, 1977, Ser. No. 811,725
Int. Cl.[2] G05D 23/12
U.S. Cl. 236—1 C 10 Claims



1. A thermally actuated phase change operated valve for controlling flow of fluid comprising,

a. valve body means having walls therein defining a fluid flow chamber,

b. said valve body means having, an inlet for passing fluid to said fluid flow chamber, an outlet means, and a pair of spaced port means in the walls of said valve body means connecting the fluid flow chamber to said outlet means,

c. valve head means in the fluid flow chamber of said valve body means slidable therein for movement from an initial calibrated setting to and fro across the spaced port means in the walls defining said fluid flow chamber to modulate the flow of fluid through said pair of spaced port means depending on the direction of movement of said valve head means,

d. phase change power means adjustably connected to one end of said valve body means exterior of said fluid flow passage including, a connecting means extending through said wall means into said fluid flow chamber and connected to said valve head means whereby on movement of said phase change power means relative the valve body means the connecting means will position the valve head means at the desired initial calibrated setting,

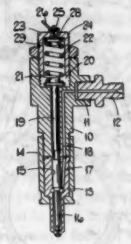
e. said phase change power means to actuate said connecting means responsive to temperature variations external to said valve so as to move the valve head means to and fro proportional to said variations in temperature and thereby vary the flow of fluid through the respective spaced port means, and

f. said valve head means sized relative the walls defining the fluid flow chamber and the pair of spaced port means respectively to permit a predetermined minimum flow of fluid to pass from said fluid flow chamber through the spaced port means to said outlet means within a limited dead band range of temperature variations which includes the temperature for the initial calibrated setting of the valve head means.

4,183,467
FLUID CONTROL VALVES

Ronald F. Sheraton, Pinner, and Brian W. Tumber, Greenford, both of England, assignors to Lucas Industries Limited, Birmingham, England

Filed Aug. 17, 1977, Ser. No. 825,417
Claims priority, application United Kingdom, Jun. 22, 1977, 26010/77
Int. Cl.[2] B05B 12/00
U.S. Cl. 239—73 9 Claims



1. A fuel injector comprising an injector body with a bore defined by a wall of said body, a fluid pressure actuated valve member slidably supported in the bore by said wall, a seating defined in the body, said valve member being shaped to cooperate with the seating to prevent flow of fluid through the injector, the valve member and seating being formed from electrically conductive material, resilient means acting to urge the valve member into contact with the seating, said valve member in use, being lifted from said seating against the action of the resilient means by fluid under pressure to permit flow of fluid through the injector, electrically insulated terminal means on said body, means within the body connecting said terminal means to the valve member, and a film of the fluid in the injector being the sole means for electrically insulating the valve member from the wall of the bore and from the body when said valve member is lifted from the seating, whereby the electrical resistance between the valve member and the body can be monitored whilst the injector is in use thereby to provide an indication of when the valve member is lifted from or moved into contact with the seating.

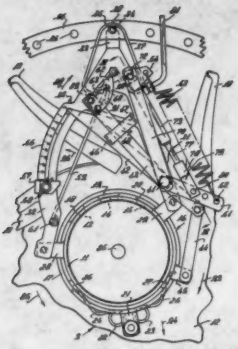
4,183,468
SPREADER

Ary van der Lely, Maasland, and Cornelis J. G. Bom, Rozenburg, both of Netherlands, assignors to C. van der Lely N. V., Zg, Netherlands

Filed May 23, 1977, Ser. No. 799,435
Claims priority, application Netherlands, May 24, 1976, 7605530
Int. Cl.[2] A01C 17/00
U.S. Cl. 239—665 2 Claims

1. A spreading member which comprises a frame, a hopper mounted on said frame, a rotatable spreading member underlying said hopper, a port in said hopper for delivering material from said hopper to said underlying spreading member, a closure member moveably mounted on said hopper for covering and uncovering said port, hydraulic actuation means interconnected to said closure member by a control arm and a linkage arm which causes said closure member to cover said port when said hydraulic actuator means is actuated, and resilient means connected to said closure member by said arms which urge said closure member to uncover said port, stop means adjustably connected to said hopper and adapted to be engaged by said linkage arm by the urging of said resilient means, said arms being connected to each other by a common shaft whereby they are rotatable about said common shaft and by limit means whereby said arms are relatively movable with respect to each other within limits, latching means for said

control arm for latching said control arm in a relatively fixed position whereby said closure is covered, said latching means adapted to latch and unlatch said control arm by sequential movement of said control arm by said hydraulic actuation within the limits of said limit means, said hydraulic activation means and said resilient means being substantially parallel and connected to said control arm on one side of said common



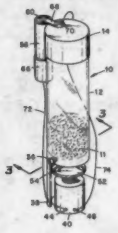
shaft and said latching means engaging said control arm on the other side of said common shaft and substantially farther therefrom than the connections of said hydraulic actuation means and said resilient means whereby small movements of said hydraulic actuation means and said resilient means cause larger movements of said control arm at said latching means and of said linkage arm to engage said stop means.

4,183,469

HAND HELD SEED SOWER

Hardy P. Weaver, 3911 Magnolia, Knoxville, Tenn. 37914

Filed Nov. 7, 1977, Ser. No. 848,863
Int. Cl.[2] A01C *17/00*
U.S. Cl. 239—687 **5 Claims**



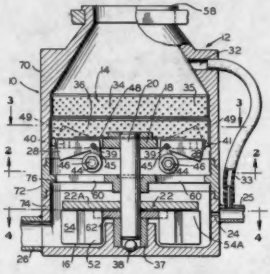
1. A seed sower for seeds of a size approximating the size of tobacco seed comprising a cylindrical storage container for being grasped in one hand of an operator, a yieldable cap closing a first end of said container, a discharge panel at a second end of said container, said discharge panel having an inner wall and an outer wall, an inner aperture defined in said inner wall, an outer aperture defined in said outer wall and communicating with said inner aperture by means of a passageway, said passageway diminishing in cross-sectional area from said inner aperture to said outer aperture, said outer aperture having a maximum opening dimension not significantly greater than about 0.05 cm and being of a geometry that will permit the passage therethrough of seeds having a size approximating the size of tobacco seeds, a battery secured to said container, a first terminal secured to said yieldable cap in position to be connected in electrical contact with one terminal of said battery by the application of pressure applied to said terminal by the same hand which holds said storage container, bracket means rigidly attached to said container, motor means attached to said bracket means, electrically conducting wire means connecting a first terminal of said motor means to one terminal of said battery, and further electrically conducting wire means connecting a second terminal of said motor to said terminal secured to said cap, distribution plate means attached to and rotatable by said motor means and disposed opposite and spaced from said outer aperture.

4,183,470

WATER ACTUATED DISPOSER

Theodore Hovartos, Van Nuys, and Walter O. Engel, Los Angeles, both of Calif., assignors to Lorraine Linder, North Hollywood, Calif.

Filed Apr. 3, 1978, Ser. No. 892,474
Int. Cl.[2] B02C *18/42*
U.S. Cl. 241—46 B **31 Claims**



1. A water actuated disposer for connection to a source of water under pressure and comprising a housing including an entry throat for waste, a grinding chamber, an impeller chamber, a rotatable abrasion disc in said grinding chamber, a first abrasive means secured to said abrasion disc, a rotatable drive shaft secured to said abrasion disc and extending into said impeller chamber; an impeller secured to said drive shaft and rotatably disposed in said impeller chamber, an impeller flywheel, a plurality of projections fixed to said impeller flywheel and defining therewith said impeller; a water jet inlet emerging into said impeller chamber and adapted to direct a stream of water toward said projections so as to impact said projections to induce rotary motion of said impeller, and an outlet port for water from said housing.

4,183,471

ALFALFA SEPARATOR

George Pfister, P.O. Box 597, Lexington, Nebr. 68850

Filed Apr. 24, 1978, Ser. No. 880,189
Int. Cl.[2] B02C *23/08, 13/288*
U.S. Cl. 241—57 **7 Claims**

1. An alfalfa separator apparatus for separating the stem portion of the alfalfa plant from the leaf portion, said apparatus comprising:

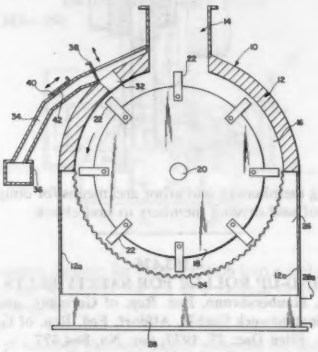
a housing including an upper wall having a generally arcuate inner surface;

intake means located on said housing for receiving alfalfa fed to the apparatus and comprising an inlet opening located centrally of the upper wall of the housing;

means defining a chamber within said housing, said chamber defining means including the upper wall of the housing and a lowermost screen portion having holes therein of such a size as to permit fine leaf portions of the alfalfa plant to pass therethrough while preventing coarse stem portions of the alfalfa plant from passing therethrough; and

a drum mounted for rotation within said chamber and including a plurality of radially extending hammers disposed about the periphery thereof;

said chamber defining means further comprising means defining a passageway, located above said screen and including a separate, discrete outlet aperture located in the upper wall of the housing in communication with said chamber, through which coarse stem portions of the alfalfa plants can pass in response to the forces generated during the rotation of said drum, said outlet aperture being



located closely adjacent to said drum laterally of said inlet opening in a position so as to receive the coarse stem portions of the alfalfa plants which are thrown off from the drum by centrifugal force, said apparatus further comprising suction means for drawing off the coarse portions of the alfalfa plants passing through said passageway and means controlling the suction time of said suction means so that a high percentage of the fine material is drawn off through said screen during an initial operating period and thereafter the coarse material is removed through said passageway.

4,183,472

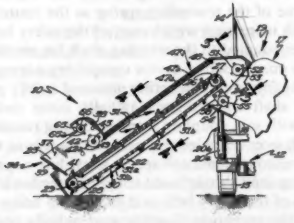
COMBINATION HAY-GRAIN FEEDER DEVICE

Charles E. Packard, Estherville, Iowa; William M. Maas, and Robert J. Seims, both of Fairmont, Minn., assignors to Art's-Way Manufacturing Co., Inc., Armstrong, Iowa

Filed Aug. 8, 1978, Ser. No. 932,199

Int. Cl.[2] B02C *23/00*

U.S. Cl. 241—200 **5 Claims**



1. A feeder device for use with a grinder-mixer apparatus, said device including:

an elongate substantially flat table structure having a material-receiving end and a discharge end,

an elongate endless conveyor mechanism mounted on said table and extending longitudinally thereof and having bale engaging elements thereon for engaging a bale of hay and having means to continuously forceably rip slab portions of hay from the bale and convey hay and grain towards said discharge end,

a feed chute mounted on said table structure adjacent said material-receiving end and projecting upwardly therefrom, said feed chute having a cross section sized to receive a bale of hay therein and located to position the bale so that one end of the bale is disposed closely adjacent the table structure,

a driven intake feeder roll having a plurality of serrated blades affixed thereto and extending outwardly therefrom mounted on said table structure closely adjacent and forwardly of said feed chute and being positioned above said conveyor, said driven intake feeder roll cooperative with said conveyor mechanism to cause portions of feed to be conveyed toward said discharge end,

a driven finger roller mounted in one side of said chute parallel to and above said feeder roll, said finger roller having a plurality of spike-like fingers which impale the material to be conveyed and force the material generally perpendicularly towards said conveyor and which controls the rate of downward feed of the material onto the conveyor,

a driven discharge feed roller mounted on the table structure adjacent the discharge end and cooperating with said conveyor mechanism to cause material to be fed into a hammer mill.

4,183,473

MECHANISM FOR COUPLING A DRIVE TO A SHAFT

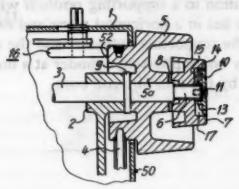
Armin Neuweiler, Steckborn, and Jakob Rickenbach, Kreuzlingen, both of Switzerland, assignors to Fritz Gegauf Aktiengesellschaft, Switzerland

Filed Dec. 7, 1977, Ser. No. 858,449

Claims priority, application Switzerland, Jan. 14, 1977, 446/77

Int. Cl.[2] F16D *19/00;* **B65H** *54/18*

U.S. Cl. 242—20 **6 Claims**



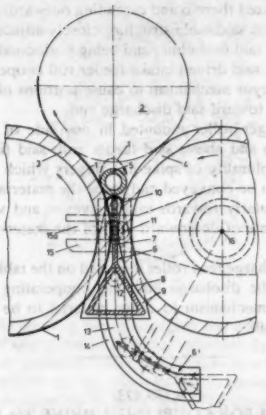
1. A mechanism for coupling and uncoupling a drive wheel to and from a rotatable shaft, particularly to an arm shaft of a sewing machine, comprising a rotatable shaft having an annular collar portion, a drive wheel freely rotatable on said shaft and having a hub portion with one end frictionally engageable with said collar portion and having an opposite end, drive means connected to said drive wheel to rotate said drive wheel, said shaft having a threaded end extending beyond the end of said drive wheel, an adjustment nut threaded to said shaft and adapted to bear against the opposite end of said drive wheel to hold it in frictional engagement with said collar to rotate said shaft with said drive wheel, a stop disc secured to the threaded end of said shaft, and cam means defined between said adjustment nut and said stop disc limiting the rotational movement of said adjustment nut to a predetermined arc of movement, said adjustment nut being adjustable by threading on said shaft through the predetermined arc in one direction to engage said drive wheel with said collar to rotate said shaft and movable in an opposite direction to release said shaft from said drive wheel.

4,183,474

APPARATUS FOR WINDING MATERIAL IN WEB FORM

Herbert Schönmeier, Dusseldorf, Fed. Rep. of Germany, assignor to Jagenberg Werke AG, Dusseldorf, Fed. Rep. of Germany

Filed Aug. 29, 1978, Ser. No. 937,906
Claims priority, application Fed. Rep. of Germany, Sep. 28, 1977, 2743616
Int. Cl.[2] B65H *17/08*
U.S. Cl. 242—66 8 Claims



1. In an apparatus for winding material in web form into a roll lying upon two spaced apart driven supporting cylinders and having a cylindrical roll core, the improvement comprising means for supporting a stand-by roll core between the roll and the supporting cylinders during the winding of the roll comprising a support member defining a supporting surface thereon and means mounting same for movement from a non-supporting position to a supporting position wherein the supporting surface lies in a horizontal plane and extends into the area between the supporting cylinders and the roll to such an extent that only one supporting cylinder at a time can be contacted linearly by the stand-by roll core.

4,183,475

APPARATUS FOR MOUNTING A HOLLOW CYLINDRICAL MEMBER

Henry M. Martija, La Verne, Calif., assignor to Bell & Howell Company, Chicago, Ill.

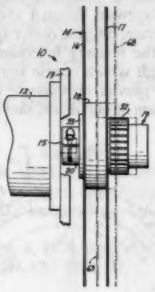
Filed Aug. 15, 1978, Ser. No. 933,410
Int. Cl.[2] B65H *17/02*
U.S. Cl. 242—68.3 17 Claims

1. Apparatus for mounting a hollow cylindrical member, comprising in combination:

an arbor;

a chuck longitudinally slidable on said arbor and including an expansible device for releasably retaining said hollow cylindrical member and a pair of tensioning members having meshing threads and being coupled to said expansible device for releasably retaining said hollow cylindrical member with said expansible device; and

means coupled to said arbor and chuck for adjusting the position of said chuck to an axial dimension of said hollow cylindrical member, including a pair of driving members having meshing threads for varying the position of said chuck along said arbor, means for coupling one of said



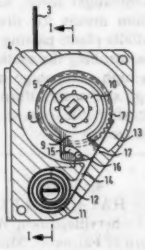
driving members to said arbor and means for coupling the other of said driving members to said chuck.

4,183,476

WIND-UP ROLLER FOR SAFETY BELTS

Artur Föhl, Haubersbronn, Fed. Rep. of Germany, assignor to Repa Feinstanzwerk GmbH, Alfdorf, Fed. Rep. of Germany

Filed Dec. 27, 1977, Ser. No. 864,477
Claims priority, application Fed. Rep. of Germany, Dec. 30, 1976, 2659644
Int. Cl.[2] B65H *75/48;* A62B *35/00*
U.S. Cl. 242—107 7 Claims



1. In a safety belt wind-up roller having a winding shaft for a safety belt, a rewind spring operatively connected to the winding shaft for rewinding the safety belt after it has been withdrawn, and a compensating device for equalizing the restoring force of the rewinding spring as the restoring force increases with increasing withdrawal of the safety belt, a coupling member coupled to the winding shaft for rotation therewith, and the compensating device comprising a compensating member in the form of a roll spring mounted axially parallel to the winding shaft and having a radially outer end forcibly engageable with said coupling member during rotation of the winding shaft over a predetermined rotary angle as the safety belt is being rewound, said roll spring providing a spring force on the winding shaft through said coupling member in unwinding direction of the safety belt, said roll spring being mounted in a cassette-like reception chamber, said radially outer end of said roll spring projecting out of said chamber and through a slot-shaped guide into vicinity of said coupling member, and including a pivotable control lever frictionally connected to said coupling member, and stop means located in vicinity of said guide and associated with said control lever for limiting the pivot angle thereof, said control lever having a clamping member cooperating with said coupling member for forcibly clamping therebetween said radially outer end of said roll spring during rewinding of the safety belt and for again releas-

ing said radially outer end of said roll spring after rotation of the winding shaft through a predetermined angle of rotation.

4,183,477

CASSETTE ADAPTER

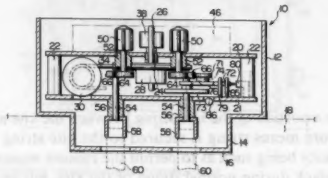
Hajime Iwase, Fujimi, and Michio Kusuyama, Hachioji, both of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Apr. 28, 1978, Ser. No. 900,923

Claims priority, application Japan, Apr. 28, 1977, 52-54900[U]

Int. Cl.[2] G11B *15/18, 23/10*

U.S. Cl. 242—198 **7 Claims**



1. A cassette adapter for incorporation into a reel drive type tape recorder to permit the use of a capstan drive type tape cassette comprising:

a plate;

a pair of rotating shafts rotatably mounted on said plate and adapted to be engaged with corresponding reel shafts of the reel drive type tape recorder so that they can be rotated together with the reel shafts;

a pair of reel shafts rotatably mounted in said adapter and over which the capstan drive type tape cassette can be fitted;

gear means for transmitting the torques of the rotating shafts to the reel shafts of the cassette adapter;

a pinch roller and capstan shaft between which a magnetic tape received in the capstan drive type tape cassette is frictionally sandwiched;

a capstan drive motor having a start switch;

connection means between said drive motor and capstan shaft;

an operation mechanism operably connected to one of the reel shafts of the reel drive type tape recorder and adapted to, when the reel shaft of the reel drive type tape recorder is rotated in a reproduction mode, be operated by the torque of the reel shaft to actuate said switch and cause the motor to be started to rotate the capstan shaft; and

a magnetic head adapted to be contacted with the magnetic tape.

4,183,478

JET THRUST REVERSER

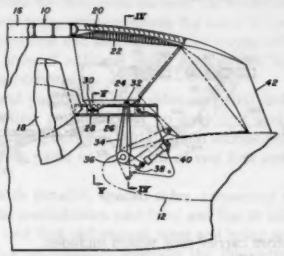
Peter K. C. Rudolph, Seattle, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Nov. 25, 1977, Ser. No. 854,554

Int. Cl.[2] B64C *15/04*

U.S. Cl. 244—110 B **11 Claims**

1. In a jet-propulsion power plant having annular engine casing means and a jet engine enclosed within said casing means at the forward end thereof, the combination of thrust reverser means comprising a cascade of vane members in the wall of said casing means at the trailing end thereof and beyond the exhaust nozzle of the jet engine, a door normally covering said cascade, tracks means extending generally parallel to the longitudinal axis of the casing along the interior wall thereof beneath said cascade, an element reciprocable on each of said track means, means pivotally connecting the foward end of the door to the respective reciprocable elements, arm means having a free end pivotally connected to the trailing end of the door and pivotally mounted at its other end along an axis which is on the side of said door opposite said cascade, the arm means being essentially perpendicular to the track means when the door covers the cascade, and actuator means for rotating the arm means, the arrangement being such that upon rotation of the arm means in one direction, the door will move backwardly on said track means to expose the cascade, continued



rotation of the arm means acting to pivot the door about its connection to the reciprocable elements to at least partially close the exit end of the engine casing and direct exhaust efflux from the engine through the cascade to produce a reverse thrust.

4,183,479

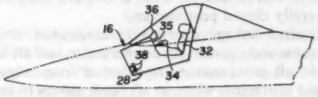
VARIABLE ATTITUDE AIRCRAFT CREW STATION

Augustus S. Sclafani, East Northport; Nathan Kirschbaum, Huntington, and William C. Tauby, Hicksville, all of N.Y., assignors to Grumman Aerospace Corporation, Bethpage, N.Y.

Filed Nov. 1, 1977, Ser. No. 847,672

Int. Cl.[2] B64C *1/14, 1/28*

U.S. Cl. 244—121 **2 Claims**



1. A variable attitude crew station for an aircraft, said station comprising:

a crew module pivotally supported in the aircraft about a forward pivot axis, said crew module including,

crew seat means;

crew instrument panel means;

control means, and

a floor pan and windscreen about the crew seat means, the crew instrument panel means and control means;

a fairing structure pivotably supported on the aircraft and adapted to telescopically close over the windscreen to provide a closed canopy for the crew module that moves as said crew module is pivoted to fair the aft portion of the canopy to surrounding aircraft structure in whatever attitude of the crew module; said fairing structure and said windscreen having a pivot connection to permit the windscreen's aft area to be telescopically received by the fairing structure; and

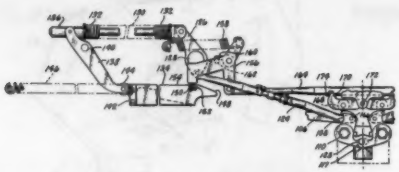
actuator means connected to said crew module so as to rotate said crew module about said pivot axis with respect to a point of interface of the windscreen and aircraft.

4,183,480

AUTOMATIC SWAY BRACING RACK

Thaddeus Jakubowski, Jr., Long Beach, Calif., assignor to McDonnell Douglas Corporation, Long Beach, Calif.

Filed Jun. 22, 1978, Ser. No. 918,046
Int. Cl.[2] B64D *1/02*
U.S. Cl. 244—137 R **10 Claims**



1. A store carrier rack which includes:
at least a first pair of store retension hooks, one located forward and the other aft on said rack;
means to actuate said hooks to open positions;
means to retain said hooks in store retaining positions until opened by said means to actuate;
sway brace means adjacent said hooks;
wedge means connected to force said sway brace means downwardly against a store retained by said hooks, said wedge means having wedging and non-wedging positions; and
interlock means to hold said wedge means in their non-wedging positions which interlock means release said wedge means to their wedging positions after said hooks retaining said store generally are in store retaining positions, said interlock means including:
forward and aft lock rods each having a forward and aft abutment;
forward pawl means positioned for releasable engagement with said forward abutments of said forward and aft lock rods;
aft pawl means positioned for releasable engagement with said aft abutments of said forward and aft lock rods;
first control linkage operatively connected to said forward pawl means and operatively connected to a forward hook so that said forward pawl means are released from engagement with said abutments when a forward hook moves to its generally closed position; and
second control linkage operatively connected to said aft pawl means and operatively connected to said aft hooks so that said aft pawl means are released from engagement with said abutments when an aft hook moves to its generally closed position, said lock rods being connected to restrain said wedge means in non-wedging positions when engaged with said pawl means.

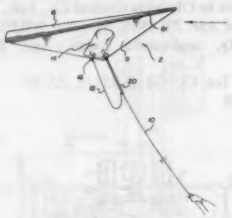
4,183,481

PARACHUTE DROPPING KITE

Lloyd C. Elson, 675 Rymal Rd. E., Hamilton, Ontario, Canada

Filed Jan. 25, 1978, Ser. No. 872,225
Int. Cl.[2] B64C *31/06*
U.S. Cl. 244—155 R **15 Claims**

15. In a parachute dropping kite comprising a kite having a frame, a covering secured thereto, a kite guide as part of the covering, a kite string to extend from the kite to the operator when the kite is in flight, and a parachute unit releasably associated with the kite, the improvement wherein the kite is provided with: a holding means to releasably secure the parachute unit to the underside of the covering and comprising a pocket secured to a side of the kite guide and opening downwardly when the kite is in normal flying orientation; a closure means removably, frictionally associated with the holding means and comprising a clip removably secured to the cover of the kite to close the opening of the pocket; a closure means string, one portion thereof secured to the closure means and another portion thereof secured to the kite string at a position proximal to but spaced from the kite and of a length between these portions such that the closure means string is slack when the closure means is associated with the holding means during flight of the kite; and a kite string length changing means



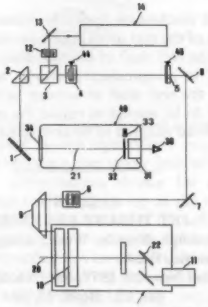
wherein a portion of the kite string between the kite and where the closure means string is secured to the kite string is elastic, its elasticity being such as to permit the closure means string to remain slack during normal flying of the kite, but to cause the closure means to become tight and remove the closure means from the holding means when the kite string is tugged.

4,183,482

NIGHT GUIDING DEVICE FOR SELF-PROPELLED MISSILES

Joseph E. Jozwiak, Paris, France, assignor to Societe Anonyme de Telecommunications, France

Filed Dec. 2, 1976, Ser. No. 746,944
Claims priority, application France, Dec. 9, 1975, 75 37631
Int. Cl.[2] F42B *15/10;* **F41G** *1/36, 1/32*
U.S. Cl. 244—3.16 **8 Claims**



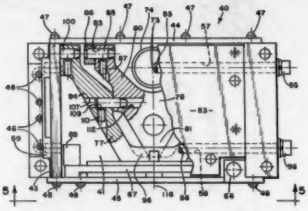
1. A device for tracking by night self-propelled missiles, comprising a daylight sighting telescope provided with an optical reticle, an eyepiece and an infrared goniometer which in association are called here daylight localizing apparatus, for tracking an infrared source carried by the missile, and a thermal telescope for night vision, to which are associated an infrared detector and a display member, further comprising a thermal reticle, optical means for providing an optical path between said eyepiece and said thermal reticle to enable viewing of the thermal reticle image in said daylight telescope, and adjusting means for bringing into coincidence the image of the optical reticle of the daylight telescope with that of the thermal reticle.

4,183,483

TRANSLATING MECHANISM

Curt H. Chadwick, Los Altos, and John E. Raffarin, Sunnyvale, both of Calif., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Filed Mar. 6, 1978, Ser. No. 883,575
Int. Cl.[2] F16M *13/00*
U.S. Cl. 248—421 **11 Claims**



1. Translating mechanism comprising

a plane base plate,

a platform disposed parallel to said plate and movable relative thereto in a first direction perpendicular to the plane of the plate,

spring means between and engaging said platform and said plate for urging the platform and plate apart,

adjustment means operably engageable with said platform and said plate for adjusting the spacing therebetween,

first and second U-shaped arms disposed between said plate and said platform and pivotally connected together along a first axis midway between said plate and said platform,

said first arm having one end pivotally connected along a second axis to and at a spacing R from said plate and having the other end thereof slideably engageable with said platform,

said second arm having one end pivotally connected along a third axis to and at a spacing R from platform and having the other end thereof slideably engageable with said plate,

said first, second and third axes being parallel to said plate,

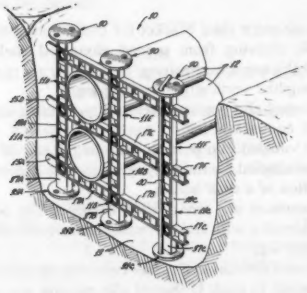
the parts of said other ends of said first and second arms engageable with said platform and plate, respectively, comprising arcuately shaped surfaces with radii of curvature, respectively, equal to R.

4,183,484

MODULAR CONDUIT SPACER RACK

Lyle H. Mathews, P.O. Box 3697, Anaheim, Calif. 92803

Filed Mar. 20, 1978, Ser. No. 888,353
Int. Cl.[2] F16L *3/22*
U.S. Cl. 248—49 **4 Claims**



1. A unit for forming a modular conduit spacer rack for supporting a plurality of conduits in parallel, spaced-apart relationship comprising:

four generally coplanar arms emanating from a central hub in mutually orthogonal directions, first and second adjacent arms having a predetermined cross-section, third and fourth adjacent arms having channels extending axially thereinto from the free ends thereof, the cross-section of said channels being approximately the same as said cross-section of said first and second arms for receipt of the first or second arms of adjacent units, each of said third and fourth arms comprising:

first and second parallel, spaced sides, said first and second sides extending perpendicular to said first and second arms, the spacing between said first and second sides being approximately equal to the width of said first and second arms; and

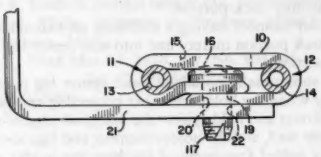
third and fourth parallel, spaced sides, connected between said first and second sides, said third and fourth sides being parallel to said first and second arms and being spaced by an amount approximately equal to the thickness of said first and second arms, said third and fourth sides of said third and fourth arms being formed from a plurality of non-overlapping, alternating segments whereby extending along said third and fourth arms, each segment terminates at or before the start of the segment of the opposite side.

4,183,485

MOUNTING BRACKET FOR A CYLINDRICAL MEMBER

Dennis M. Gladieux, Fort Wayne, Ind., assignor to International Harvester Company, Chicago, Ill.

Filed Sep. 25, 1978, Ser. No. 945,354
Int. Cl.[2] F16L *3/22;* A44B *21/00*
U.S. Cl. 248—68 R **5 Claims**



1. A mounting bracket for securing two parallel spaced-apart cylindrical members to a supporting structure, comprising an oval shape clip, having opposite terminal ends extending toward and overlapping one another along one lateral side of the clip, the longitudinal sides of the clip forming semi-cylindrical loops adapted to nest the cylindrical members therein, and fastening means for fastening the overlapping ends of the clip to one another and for attaching the fastened clip ends to the supporting structure.

4,183,486

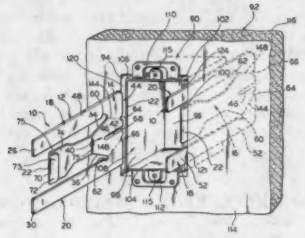
HOLDER ARRANGEMENT FOR ELECTRICAL WIRING BOXES

Vincent F. Esoldi, Sterling, N.J., assignor to Raco Inc., South Bend, Ind.

Filed Aug. 28, 1978, Ser. No. 937,046
Int. Cl.[2] H02G *3/12, 3/18;* F16B *5/06*
U.S. Cl. 248—205 R **11 Claims**

1. A holder arrangement for supporting an electrical wiring box in wallboard in an opening formed in the wallboard proportioned to closely receive the box in which the wallboard defines front and back faces on either side of same and the box defines a back wall and a side wall structure including a pair of opposed side walls upstanding from the box back wall, with said wall structure being arranged in closed perimeter relation about the margin of the box back wall to define the interior of the box and the open front of the box, with said holder arrange-

ment comprising a holder member of E shaped general configuration defining a back portion and three legs projecting from said back portion from the same edge of the back portion and comprising a center leg and a pair of end legs disposed on either side of the center leg, with the holder member being proportioned to be slipped between the box, when received in the wallboard opening with its open front facing forwardly, and one edge of the opening corresponding to one of the box side walls, for disposing the holder member back portion rearwardly of the wallboard back face and the projecting end portions of the holder member legs in forwardly projecting relation, and for folding over the outer marginal edge of said one box side wall, for seating of the holder member back portion against the wallboard back face, together with a like holder member similarly applied between the box and the edge of the wallboard opening that corresponds to the box side wall opposing said one box side wall, hold the box in the opening,



the improvement wherein said holder member comprises:

said center leg at its portion connecting same to the holder member back portion being of trapezoidal configuration defining side edge portions that diverge in the direction of the member back portion,

said holder member having a stiffening rib extending across said back portion thereof and into said center leg connection portion,

said rib substantially paralleling said center leg portion,

whereby when the holder member projecting end portion is folded over and held against the marginal edge of said box one side wall, and the holder member end legs are consecutively pulled forwardly of the box, the holder member back portion is seated against the wallboard back face with said center leg connecting portion seated diagonally against the box one side wall and bent about said rib to define a dihedral wall bracing structure.

4,183,487

WALL BRACKET

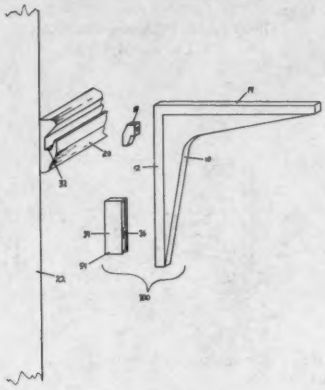
C. Daniel Swain, Tacoma, Wash., assignor to Comerco, Inc., Tacoma, Wash.

Filed Dec. 15, 1977, Ser. No. 861,016

Int. Cl.[2] **E04G** *3/00*

U.S. Cl. 248—214 **8 Claims**

1. A vertically adjustable wall bracket system comprising a wall bracket, key member, and spacer member, said wall bracket defining a horizontal surface and a vertical surface perpendicular to said horizontal surface, a plurality of upwardly projecting protruding members removably mounted to said horizontal surface, said vertical surface being provided with a plurality of vertically spaced apertures, said wall bracket further comprising a support member which is fixedly secured to a member sought to be supported by said system, said support member defining a longitudinal channel specifically adapted to receive said upwardly protruding removable members and being adapted to be slid over the upwardly protruding members to provide longitudinal stability, said longitudinal channel and said removable members forming a tongue and groove type assembly, said key member comprising a leg member adapted to be supported by a wall rail, said key member being removably secured to any of said vertically spaced apertures, said spacer member also being secured to said vertical surface in a position beneath said key member, said spacer



member serving to keep said horizontal surface of said wall bracket in a level condition.

4,183,488

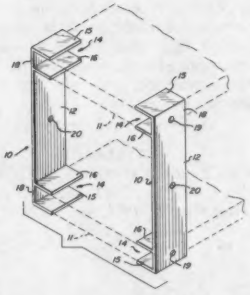
BRACKETS FOR CONSTRUCTING TEMPORARY OR MOVEABLE SHELVING

John S. Shepard, 1304 S. Shields St., Ft. Collins, Colo. 80521

Filed Jun. 6, 1978, Ser. No. 913,202

Int. Cl.[2] **A47G** *29/02;* **A47B** *3/00*

U.S. Cl. 248—247 **3 Claims**



1. A one-piece shelf bracket for constructing temporary or moveable shelving from spaced elongated shelf boards of standard thickness, comprising:

an elongated vertically extending leg;

a U-shaped clip portion integrally projecting laterally from each end of said leg;

each U-shaped clip portion including a pair of spaced clip arms adapted for snug engagement with the marginal edge portion of a shelf board;

the outermost clip arm of each U-shaped clip portion being coextensive with and extending laterally from an end edge of said leg;

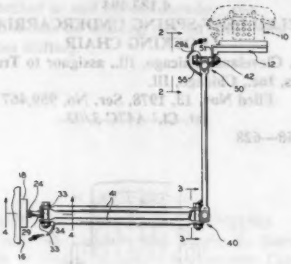
and means defining a fastener receiving aperture in said leg adjacent to each U-shaped clip portion and opening between said clip arms for receiving a fastener for securing said bracket to the marginal edge portion of a shelf board.

4,183,489

ADJUSTABLE BRACKET

Joseph E. Copher, 3607 Monroe St., Bellwood, Ill. 60104, and Arthur B. Lucas, 8714 W. Fullerton, River Grove, Ill. 60121

Filed Nov. 20, 1978, Ser. No. 962,015
Int. Cl.[2] A47F 5/00; A47H 1/10
U.S. Cl. 248—278 **4 Claims**



1. A universally adjustable bracket comprising a mounting end and an object-supporting end:

(a) means at one end to secure the bracket by its mounting end to a supporting surface;

(b) a rotatably adjustable stud extending from the bracket-mounting means;

(c) means to lock the stud in a selected angular position,

(d) a first rotatably adjustable sleeve received over the stud;

(e) means to lock the first sleeve in a selected angular position;

(f) a second sleeve having a longitudinal axis and affixed to the first sleeve with the respective axes at right angles;

(g) a first pair of spaced parallel coextensive arms extending outwardly from the second sleeve and jointly adjustably secured to the second sleeve;

(h) a third sleeve having a longitudinal axis to space the opposite distal ends of the first arms;

(i) means to effect angular adjustment of the third sleeve;

(j) means to maintain said angular adjustment;

(k) a fourth sleeve having a longitudinal axis affixed with its axis perpendicular to the axis of the third sleeve;

(l) a second pair of spaced parallel coextensive arms secured to and extending outwardly from the fourth sleeve;

(m) a fifth sleeve between the respective distal ends of the second pair of arms;

(n) means enabling angular adjustment of the fifth sleeve;

(o) means to maintain the adjusted position;

(p) a sixth sleeve having a longitudinal axis secured transversely of the fifth sleeve; and

(q) means carried by the sixth sleeve to support an ultimate object on the bracket.

4,183,490

ARRESTING DEVICE FOR AN ANTENNA PART OF A SPACE VEHICLE

Marco Montanarini, Schlieren, Switzerland, assignor to Contraves AG, Zurich, Switzerland

Filed Oct. 19, 1978, Ser. No. 952,948
Claims priority, application Switzerland, Oct. 28, 1977, 7713141
Int. Cl.[2] H01Q 1/12
U.S. Cl. 248—291 **3 Claims**

1. An arresting device for a function element, especially an antenna part of a space vehicle, articulated to a support, comprising:

means mounting said function element so as to be pivotable about a first axis out of a rest position into a work position;

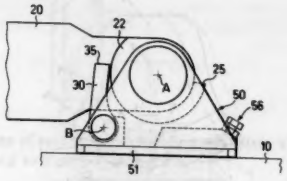
means for automatically locking said function element in the work position;

said locking means comprising:

a bracket pivotable about the first axis;

a pawl operatively coacting with the bracket in the work position of the function element and pivotable about means defining a second axis,

said pawl having at least one substantially arcuate-shaped end surface;



said arcuate-shaped end surface of the pawl, in a sectional plane viewed perpendicular to the second axis, having a center arranged in spaced relationship with respect to the second axis;

said bracket having a slide surface radially outwardly directed with regard to the first axis;

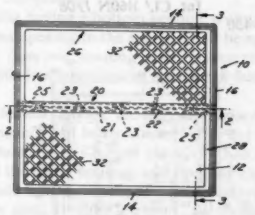
said slide surface, in the work position of the function element, acting at a point of contact of the pawl and bracket upon the end surface in such a manner that the bracket retains the pawl in an arrested position.

4,183,491

REINFORCED PALLET

Ellsworth E. Sanders, Sanibel Island, Fla., and Edward L. Stahl, Richmond, Mich., assignors to Pinckney Molded Plastics, Inc., Pinckney, Mich.

Filed May 11, 1978, Ser. No. 904,865
Int. Cl.[2] B65D 19/32
U.S. Cl. 248—346 **4 Claims**



1. A plastic pallet having a rectangular bottom wall, integral retaining walls extending upwardly along the four edges of said bottom wall, said retaining walls having lower edge portions disposed beneath the upper supporting surface of said bottom wall, said bottom wall having an elongated downwardly opening channel molded into its underside and including flanges extending downwardly from the upper supporting surface of said bottom wall, said channel extending through the midpoint of said bottom wall from one retaining wall to the opposite retaining wall at right angles thereto, said lower edge portions of said one retaining wall and said opposite retaining wall defining end walls for said channel, and an elongated reinforcing strip of plastics material, said strip extending lengthwise of said channel throughout the full length thereof and secured to the free lower edges of the channel flanges and to the lower edge portions of said one retaining wall and said opposite retaining wall to close the space within said channel.

4,183,492

VEHICLE SEAT

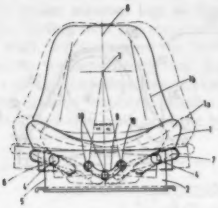
Hermann Meiller, Amberg, Fed. Rep. of Germany, assignor to Willibald Grammer, Amberg, Fed. Rep. of Germany

Filed Nov. 7, 1977, Ser. No. 848,992

Claims priority, application Fed. Rep. of Germany, Oct. 11, 1977, 7731339[U]

Int. Cl.[2] A47C *1/02*

U.S. Cl. 248—395 **4 Claims**



1. A vehicle seat comprising a seating member, tilting means on said seating member for performing a tilting motion about a pivotal axis extending parallel to the direction of vehicle travel, said pivotal axis being spaced above said seating member, said tilting means being supporting brackets having at least two guide tracks symmetrically disposed in relation to a vertical medial line of the seat, each of said guide tracks being inclined upward and outward toward opposite sides of said seating member and being substantially upwardly convex, and at least two horizontal journals attached to said vehicle engaged in respective guide tracks.

4,183,493

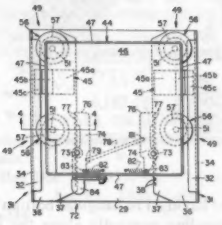
ROLLER FORE-AFT ADJUSTMENT FOR A VEHICLE SEAT

L. John Koutsky, Milan, Ill., assignor to Sears Manufacturing Company, Davenport, Iowa

Continuation-in-part of Ser. No. 758,979, Jan. 13, 1977. This application Feb. 9, 1978, Ser. No. 876,515

Int. Cl.[2] B60N *1/08*

U.S. Cl. 248—430 **7 Claims**



1. A fore-aft adjustment and support mechanism for a vehicle seat, comprising: upper base means; fixed, lower base means disposed closely below and out of weight-supporting contact with the upper base means, said upper base means being movable fore-aft relative to the lower base means; a plurality of parallel fore-aft guide rail means fixed to one base means and spaced laterally from and out of weight-supporting contact with the other base means, each rail means having a flat, fore-aft weight-bearing surface; a plurality of guide roller means journaled on said other base means on parallel generally upright axes offset laterally from the respective rail means and cooperative with said respective rail means to carry the entire weight of the upper base means on the lower base means, each roller means including a flat, circular radial face overlapping and engaging flatwise with its associated rail means surface to accommodate total downward loading on the mechanism, whereby the roller means turn about their respective axes by virtue of said engagement with said respective guide rail surfaces as the two base means move relative fore and aft; and releaseable means for selectively locking the two base means against said relative movement fore and aft.

4,183,494

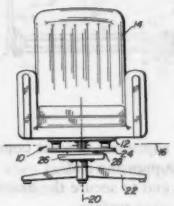
SWIVELED LEAF-SPRING UNDERCARRIAGE FOR ROCKING CHAIR

Robert M. Cleveland, Chicago, Ill., assignor to Trendler Metal Products, Inc., Chicago, Ill.

Filed Nov. 13, 1978, Ser. No. 959,467

Int. Cl.[2] A47C *3/02*

U.S. Cl. 248—628 **2 Claims**



1. In a free-floating undercarriage for a chair having forward and backward rocking, sidewise-tilt and swivel axes, the combination with a swivel means comprising:

(a) a plurality of open-ended, U-shaped leaf-springs straddle-mounted between the chair and the swivel means on each side of the sidewise-tilting axis, each spring having its flexural axis in coincidental relation with the rocking axis of the chair and intersecting the swivel axis of the same and each spring having parallel legs opening in a direction facing rearwardly of the chair; and

(b) a single open-ended, U-shaped leaf-spring likewise mounted between the chair and swivel means coincident with the sidewise-tilt axis of the chair having its flexural axis in like coincidental relation with the rocking axis of the chair and intersecting the swivel axis of the same and parallel legs opening in a direction facing forwardly of the chair.

4,183,495

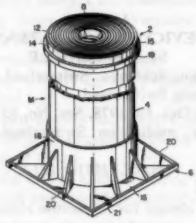
BASE SUPPORT MOUNT FOR HEAT PUMPS AND LIKE MACHINERY

Brian D. Adam, and Douglas G. Adam, both of P.O. Box 1434, Sioux City, Iowa 51102

Filed Jun. 19, 1978, Ser. No. 917,103

Int. Cl.[2] F16M *13/00*

U.S. Cl. 248—558 **11 Claims**



1. A base support mount for a machine and the like comprising:

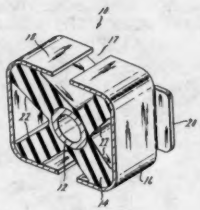
(a) a top cap, central column and ribbed base;
(b) said top cap having means for supporting said machine and having a top surface and a side surface;
(c) said central column being separable from said top cap and ribbed base;
(d) said ribbed base having means for supporting said central column including ribs, a bottom member and an upstanding cylinder with said ribs extending from said cylinder and connected to said bottom member; and
(e) anti-skid means on said top cap for preventing said machine from shifting.

4,183,496

LOW RATIO ENGINE MOUNTING

Waine T. Brock, Mt. Clemens, and Wayne E. Katzer, Lake Orion, both of Mich., assignors to Chrysler Corporation, Highland Park, Mich.

Filed Aug. 30, 1978, Ser. No. 938,132
Int. Cl.[2] F16F *15/00*
U.S. Cl. 248—638 **6 Claims**



1. An engine mount adapted to be interposed between a first chassis portion and a second engine portion for driving said chassis, said mount comprising:
an outer housing having means for attachment of one of the portions to be joined, said outer housing being formed from two separate and distinct pieces haveing a gap therebetween;
an inner cylindrical member adapted to engage the second portion to be joined and
an elastomeric member which has a portion encircling the inner cylindrical member and at least three arms having one end attached to the encircling portion and the other end in contact with the housing, whereby the vibration damping quanties are essentially radially constant.

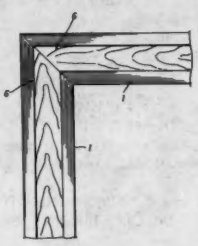
4,183,497

CHAMFER STRIP FOR CONCRETE STRUCTURES

Daniel Tamez, 6305 Tulsa, Apt. #4, Houston, Tex. 77092

Filed Sep. 11, 1978, Ser. No. 941,225
Int. Cl.[2] E04G *11/06, 11/08*
U.S. Cl. 249—205 **6 Claims**

1. A chamfer device for use in the construction of concrete structures having bevelled edges which comprises:
an elongated strip having two parallel chamfers spaced apart by a distance sufficient to form a longitudinal channel adapted to receive in a concrete sealing relationship the upright edge of a nominally sized two inch form of lumber, said chamfers oriented such that the exterior longitudinal edges of said strip are bevelled, said strip adapted to be attached to a support structure.

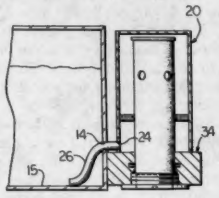


4,183,498

DRAINING APPARATUS FOR A FLUID RESERVOIR

Thomas J. Hajek, II, Joliet, and Robert G. Henderson, Morris, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Division of Ser. No. 777,386, Mar. 14, 1977, Pat. No. 4,155,534.
This application Dec. 18, 1978, Ser. No. 970,407
Int. Cl.[2] F16K *31/58*
U.S. Cl. 251—144 **3 Claims**



1. Draining apparatus for a fluid reservoir having an opening and a chamber comprising:
a guide housing having a bottom portion, a closed top, sidewalls and an opening in the sidewall and being positioned about said reservoir opening with the reservoir opening and the guide housing sidewall opening in fluid communication;
a dividing element having an internal surface defining a circular opening and being connected to the sidewalls of the guide housing at a higher elevation than the sidewall opening of the guide housing, said dividing element dividing the guide housing into a first fluid receiving chamber defined by said dividing element, the bottom and the sidewalls and a second chamber defined by said dividing element, the closed top and sidewalls of the guide housing and which is substantially free of fluid;
a carrier conduit having first and second end portions, a sidewall extending between the end portions, and an opening in the sidewall, and extending through the dividing element opening and being extendable through the guide housing to a location sufficient for passing fluid from the reservoir chamber through said second end portion;
seal means for blocking fluid flow between said internal surface of the dividing element and the carrier conduit; and
a stop element positioned on and closing the first end portion of the carrier conduit, said carrier conduit being movable relative to the guide housing between a first position at which the carrier conduit sidewall opening is within the second guide housing chamber and free from fluid communication with the reservoir chamber and a second position at which the carrier conduit extends to said fluid

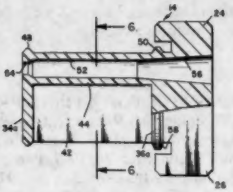
passing location and the carrier conduit sidewall opening is within the first guide housing chamber and in fluid communication with the reservoir chamber, said stop element abutting the dividing element at the second position at a location sufficient for automatically positioning the carrier conduit sidewall opening adjacent the bottom of the guide housing.

4,183,499

FLUID METERING VALVE

Delbert D. Swartz, 4808 Asteria St., Torrance, Calif. 90503, and Masayuki Tamaya, 11232 Central Ave., South El Monte, Calif. 91733

Filed Aug. 4, 1978, Ser. No. 931,200
Int. Cl.[2] F16K *5/10*
U.S. Cl. 251—208 **8 Claims**



1. A fluid metering valve comprising:
a tapered cylinder having walls and a base member,
an external projecting tapered port member communicating with the interior of said cylinder through said base member, said cylinder having an inside diameter terminating with a lip having a camming surface defining an enlarged internal diameter,
a rotatable piston adapted to nest within said cylinder and restrained by said lip from axial movement,
said piston comprises a lower disc and an upper disc and in which the external diameter of the lower disc provides an interference fit with the internal diameter of said cylinder near said base member and in which the external diameter of the upper disc is larger than the internal diameter of said lip,
a through port in said piston adapted to be aligned with said port member in said base member thereby providing a maximum flow rate,
said port in said piston abutting with said port member in said cylinder along an arcuate tapered passageway whereby rotating said cylinder controls flow rate from a maximum to a minimum.

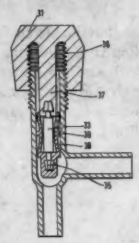
4,183,500

CONTROL VALVES

Douglas D. J. Nightingale, St. Albans, England, assignor to Imperial Chemical Industries Limited, London, England

Filed Aug. 16, 1977, Ser. No. 825,150
Claims priority, application United Kingdom, May 9, 1977, 19382/77; Japan, Jul. 18, 1977, 30053/77
Int. Cl.[2] F16K *1/04*
U.S. Cl. 251—335 R **17 Claims**

1. A valve for controlling fluid flow comprising a hollow body having a smooth-surfaced bore and a flow passage for the fluid, and a spindle movable along the bore to occlude the flow passage during operation of the valve; the spindle comprising a stem enclosed at one end by a sheath of polymeric material attached to the stem so that movement of the stem along the bore effects corresponding movement of the sheath; the sheath comprising a tubular side wall extending from a closed end portion, at least one tubular portion of the side wall being flexible and being suspended clear of the stem to permit said tubular portion to flex radially inwards towards the stem, the tubular portion having means defining at least one integral annular ridge extending from its external surface to meet the surface of the bore, said ridge being substantially transverse to said tubular portion and bore, the ridge being oversize with respect to the bore and being accommodated within the bore



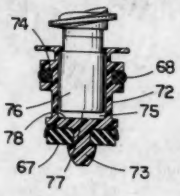
by inward flexing of the tubular portion, so that resistance to this flexing along serves to bias the ridge against the bore surface to provide a seal against loss of fluid from the valve.

4,183,501

CONTROL VALVE

Eugene R. Flynn, Farmington Hills, Mich., assignor to Manville Manufacturing Corporation, Pontiac, Mich.

Filed Jun. 24, 1977, Ser. No. 809,672
Int. Cl.[2] F16K *1/34*
U.S. Cl. 251—357 **1 Claim**

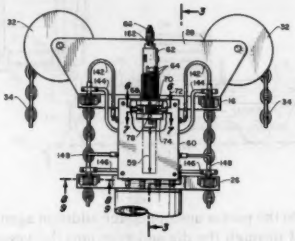


1. In a valve assembly, the combination comprising:
a rotatable stem having a cylindrical end portion and a shoulder thereon separating said end portion from the remainder of said stem and facing in a direction opposite said end portion;
a stem end member including a replaceable sealing portion engageable with a valve seat to block fluid flow through the seat;
said stem end member having a blind hole receiving said stem end portion therein;
said stem end member having retaining arms, said retaining arms having inwardly extending latching fingers normally disposed in abutting relationship on said shoulder to preclude removal of said stem end portion from said stem end member;
said stem and said stem end member having colinear axes;
said arms extending generally parallel to said axes, said latching fingers extending generally perpendicular to said axes, said arms being radially and resiliently expandable at the location of said latching fingers to permit intentional termination of said abutting relationship on said shoulder by removal of said fingers from said shoulder and subsequent removal of said stem from said member;
said retaining arms further including radially outwardly extending guide fingers adjacent said latching fingers to preclude said resilient separation of said arms when said guide fingers are confined in a bore having an axis colinear with said stem axis.

4,183,502
HYDRAULIC CHAIN JACK AUTOMATIC LATCH CONTROL SYSTEM

Clifford I. Skaalen, Oxnard, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 16, 1978, Ser. No. 916,410
Int. Cl.[2] B66F *1/08*
U.S. Cl. 254—110 **14 Claims**

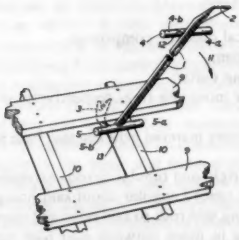


1. A chain jack comprising:
a. at least one chain;
b. an upper latch assembly having latches for selectively engaging and disengaging the links of said chain;
c. a lower latch assembly having latches for selectively engaging and disengaging the links of said chain;
d. means for imparting relative movement between said upper and lower latch assemblies;
e. means for actuating said latches in and out of engagement with the links of said chain;
f. a control piston having logic surfaces thereon, said piston being connected to move with said upper latch assembly;
g. a pair of followers engageable with said logic surfaces;
h. a control pin engageable with said logic surfaces for controlling the engagement of said followers with said logic surfaces, said control pin being stationary with respect to said lower latch assembly;
i. hydraulic means connected to said followers for controlling the movement of said latches in and out of engagement with said chain at predetermined relative positions of said control piston and said pin; and
j. whereby the movement of said latches in conjunction with the relative movement of said upper and lower latch assemblies results in progressive relative movement between said chain and said lower latch assembly.

4,183,503
DEMOLITION TOOL

Leslie J. Ward, 2450 Blackwood Dr., Vineland, N.J. 08360

Filed Nov. 22, 1978, Ser. No. 962,881
Int. Cl.[2] B66F *3/00*
U.S. Cl. 254—131 **8 Claims**

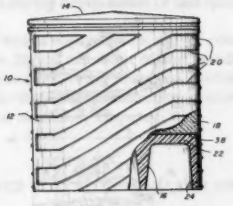


1. A demolition-tool including an elongated stem having a prying member at each of the opposite ends thereof, and including a pivot-and-handle bar at each end of said stem in operative juxtaposition to the prying members, said pivot-and-handle bars being disposed crosswise of the stem, with the two opposite portions thereof arranged and extending from the stem in opposite directions to a distance sufficient for either opposite portion thereof so as to serve as an off-center pivot when the prying member adjacent thereto is in its prying position and arrange for the opposite portions thereof to serve as a pair of force-applying and anti-tilt handles when the prying member at the far end of the stem is in its prying position, and each of said pivot-and-handle bars being affixed to the stem.

4,183,504
HIGHWAY SACRIFICIAL BARRIER

Frederick Ford, Box 312, Whitefield, N.H. 03598

Filed Apr. 20, 1978, Ser. No. 898,281
Int. Cl.[2] E01F *15/00*
U.S. Cl. 256—13.1 **10 Claims**

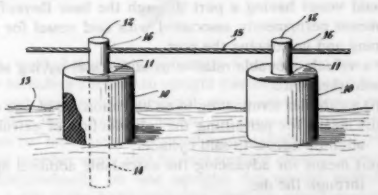


1. A sacrificial inertial barrier assembly comprising:
an outer, frangible container,
a frangible support table within said container, p1 a dispersible mass also within said container, said table having an upper wall for supporting said mass,
the improvement comprising said table having means defining a continuous, circumferential outer sealing surface which is wedge-shaped in a vertical cross-section, said table having its maximum circumference at said sealing surface and a gradually reduced circumference above and below said sealing surface, said surface being frictionally engageable with the interior wall of said container and compressible thereagainst whereby migration of any portion of said dispersible mass between said container wall and said sealing surface is effectively negated.

4,183,505
GUARD BARRIER SYSTEM

Frederick A. Maestri, 66 Forbell Dr., Norwalk, Conn. 06850

Filed Sep. 20, 1978, Ser. No. 943,766
Int. Cl.[2] E01F *15/00*
U.S. Cl. 256—13.1 **6 Claims**



1. A guard barrier system comprising in combination a plurality of posts adapted to be spaced along a roadway or the like in generally vertical position with their lower ends fixed to the

ground, a generally cylindrical, substantially solid, resilient bumper element mounted axially on each post for rotation thereon by the posts extending through longitudinal axial bores through the bumper elements, respectively, the bottom ends of said bumper elements resting on the ground to be in frictional engagement therewith for providing drag on rotation of the bumper elements, and a stringer element extending between each adjacent pair of posts supported on said posts said stringer element comprising one of a cable threaded through adjacent posts and a rail attached to successive posts, above the bumper elements thereon.

4,183,506

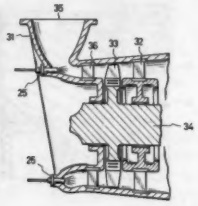
PROTECTIVE DEVICE FOR TURBINE DRIVEN BY EXHAUST GAS FROM BLAST FURNACE

Kiyomi Teshima, and Yukimasa Kajitani, both of Tamano, Japan, assignors to Mitsui Engineering & Shipbuilding Co., Ltd. and Nippon Steel Corporation, both of Tokyo, Japan

Filed Sep. 21, 1977, Ser. No. 835,303

Int. Cl.[2] C21D *11/00*

U.S. Cl. 266—88 **10 Claims**



1. In connection with a blast furnace of the type subject to a blow-out phenomenon, a protective device for a turbine adapted to be driven by exhaust gas generated in said blast furnace, said protective device comprising spraying means for spraying cooling water to a gas transportation passage between said blast furnace and said turbine, and detection means for sensing the blow-out phenomenon in said blast furnace, said spraying means being activated on receipt of a signal from said detecting means.

4,183,507

SYSTEM FOR INTRODUCING ADDITION AGENTS INTO VESSEL OF MOLTEN METAL

Eldon D. Miller, Zelienople, Pa., assignor to Lava Crucible Refractories Co., Pittsburgh, Pa.

Filed Jul. 12, 1978, Ser. No. 923,952

Int. Cl.[2] C21C *7/00*

U.S. Cl. 266—216 **3 Claims**

1. A system for treating molten metal with addition agents comprising:

(a) a refractory lined vessel for containing the molten metal, said vessel having a port through the base thereof, and means permanently associated with said vessel for stopping and unstopping the port,

(b) a vehicle movable relative to said vessel having associated therewith

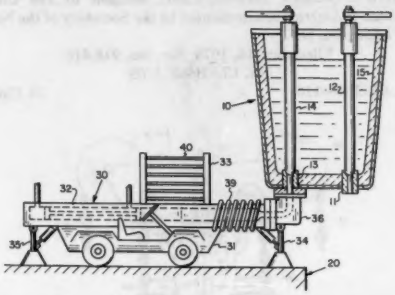
(i) a cylinder terminating in an extrusion die at one end,

(ii) means for permitting the introduction of extrudable addition agents to said cylinder,

(iii) means for advancing the extrudable addition agents through the die,

(iv) means for releasably connecting the die to the port in said vessel without interfering with said means for stopping and unstopping the port,

whereby when the port is stopped the vehicle can be brought near the vessel and the die connected to the port, and when the port is stopped the cylinder may be charged,



and when the port is unstopped the addition agents may be extruded through the die and port into the vessel.

4,183,508

METALLURGICAL INDUCTION HEATING APPARATUS

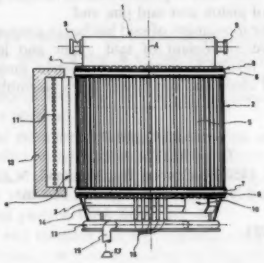
Jacques Michelet, Metz, and Hugues Zanetta, St-Julien-les-Metz, both of France, assignors to Institut de Recherches de la Siderurgie Francaise, Saint-Germain-en-Laye, France

Filed Oct. 4, 1977, Ser. No. 839,316

Claims priority, application France, Oct. 4, 1976, 76 29996; Nov. 16, 1976, 76 34679

Int. Cl.[2] F27B *14/00, 14/06*

U.S. Cl. 266—242 **9 Claims**



1. A metallurgical crucible comprising:

a metallic base pan;

a metallic holding collar;

upper and lower mounting rings respectively on said collar and pan;

a lining of refractory material between said base pan and said collar;

a plurality of upright and tubular tierods extending between said rings and spaced angular about said lining;

means for securing said rods to said rings and thereby clamping said lining in place between said base pan and said collar; and

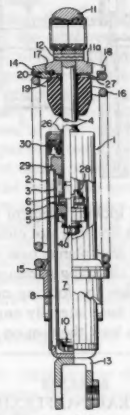
means for circulating a cooling fluid through said tubular tierods.

4,183,509

SHOCK ABSORBER FOR VEHICLE USE

Masao Nishikawa, Tokyo, and Hitoshi Yamamoto, Asaka, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 14, 1978, Ser. No. 878,222
Claims priority, application Japan, Mar. 22, 1977, 52-31334
Int. Cl.² F16F *9/44*
U.S. Cl. 267—8 R **2 Claims**



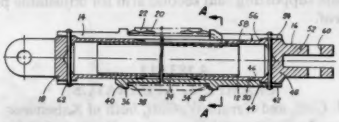
1. A shock absorber for vehicular use employing: a tubular casing provided at one end with a first mounting member for connection with a wheel-supporting member of a vehicle, a cylinder fixedly received in said casing, a piston slidably fitted in said cylinder to define a pair of first and second fluid chambers on the opposite sides thereof, a piston rod connected at one end with said piston and provided at the other end with a second mounting member for connection with a body portion of the vehicle, a damping-force control mechanism arranged in said cylinder for controlling the damping effect upon sliding movement of said piston relative to said cylinder, a first spring seat mounted on said piston rod for turning movement relative thereto, a second spring seat secured to said tubular casing, a suspension spring arranged between said first and second spring seats, a click stop mechanism provided between said first spring seat and said first mounting member for controlling the turning of said first spring seat relative to said piston rod in a stepwise manner, an adjusting sleeve fitted over said piston rod for rotation relative thereto, said adjusting sleeve being operatively connected at its opposite ends with said first spring seat and said damping-force control mechanism, said damping-force control mechanism comprising a first and a second fluid passageway formed in said piston for fluid communication between said first and second fluid chambers, an orifice disc connected to the adjusting sleeve on one side of said piston, for rotation relative to the latter and formed with a plurality of orifices of different diameters, said orifices being arranged so as to be selectively placed in fluid communication with said first fluid passageway upon rotation of said orifice disc relative to said piston, and a normally closed valve member arranged on the other side of said piston so as to open said second fluid passageway when the pressure in said first fluid chamber is increased to reach a predetermined level.

4,183,510

SPRING BUFFER

George E. Kontis, South Burlington, Vt., assignor to General Electric Company, Burlington, Vt.

Filed Oct. 21, 1977, Ser. No. 844,160
Int. Cl.² F16F *1/52*
U.S. Cl. 267—70 **14 Claims**



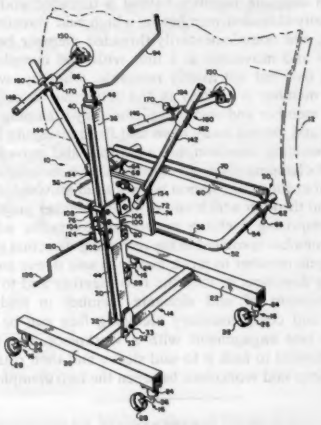
1. A double acting spring buffer comprising:
tubular spring means having a longitudinal axis of compression and a first maximum diameter;
a spindle assembly having a longitudinal axis of compression and extension, and having
a first set of means engaged with and for compressing said spring means during compression of said spindle assembly, and
a second set of means engaged with and for compressing said spring means during extension of said spindle assembly;
said spindle assembly being disposed within said spring means and having a second maximum diameter no greater than said first maximum diameter.

4,183,511

WORK HOLDER FOR ADJUSTABLY SUPPORTING A WORKPIECE

Richard G. Marek, 819 - 60th St., Kenosha, Wis. 53140

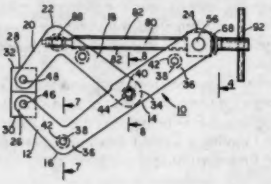
Filed Aug. 30, 1978, Ser. No. 938,058
Int. Cl.² B66F *3/00*
U.S. Cl. 269—17 **12 Claims**



1. A work holder for supporting a workpiece, the work holder including a frame, an upright member supported by said frame and having a longitudinal axis, a support member for supporting the workpiece, means for supporting the support member for movement along said longitudinal axis including a bracket member supported by said upright member and movable longitudinally on said upright, for pivotal movement about a generally horizontal axis, and for tilting movement about an axis transverse to said generally horizontal axis and transverse to said upright member, an upwardly and outwardly extending arm supported by said bracket member, a second arm supported by said upwardly and outwardly extending arm,

said second arm having a free end supporting a suction member, said suction member being engageable with said workpiece for support thereof, a pair of collars, each of said collars having a longitudinal axis, said collars being joined together in side-by-side relation and with the longitudinal axes of said collars being angularly disposed, one of said collars being adjustably supported longitudinally and circumferentially on said upwardly and outwardly extending arm, and the other of said collars supporting said second arm for adjustable positioning thereof.

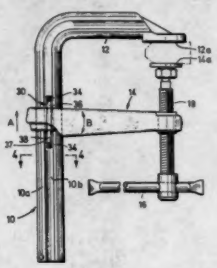
4,183,512
CLAMPING APPARATUS
Melvin J. Goff, and Gerald W. Goff, both of Kalamazoo, Mich., assignors to Continental Pump, Inc., Portage, Mich.
Filed Oct. 16, 1978, Ser. No. 951,767
Int. Cl.[2] B25B *1/12*
U.S. Cl. 269—185 **5 Claims**



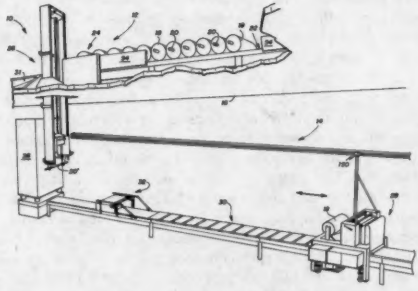
1. In a clamping apparatus comprising a base member having a clamping face fixed relative thereto and a complementary clamping face moveable toward and away from juxtaposition with the fixed clamping face, and moving and clamping means for moving said complementary clamping face toward and away from juxtaposition with said fixed clamping face and for clamping a work piece between the two clamping faces, the combination in which said moving and clamping means comprises; an elongate member having a threaded end; a complementarily-threaded member in which said threaded end is threaded, said complementarily-threaded member being connected to and moveable as a unit with said complementary clamping face but not axially rotatable, whereby, when said elongate member is rotated in the retracting direction, said threaded member and said complementary clamping face are retracted and moved away from said fixed clamping face and, in the advancing direction, are advanced and moved toward said fixed clamping face; a rotatable sleeve mounted on said base member for axial rotation but not axial movement relative thereto and through which said elongate member projects, said sleeve comprising a clutch mechanism operative when said elongate member is rotated in the retracting direction to permit said elongate member to move axially in said sleeve and, in the advancing direction, to lock the two together and to prevent axial movement of said elongate member in said sleeve, whereby said complementary clamping face can be quickly advanced into engagement with a workpiece, the elongate member rotated to lock it to said sleeve and then rotated further to clamp said workpiece between the two clamping faces.

4,183,513
CLAMP WEDGE
Erhard Enz, Boennigheim-Hofen, Fed. Rep. of Germany, assignor to Bessy & Sohn G.m.b.H. & Co., Stuttgart, Fed. Rep. of Germany
Filed Nov. 7, 1978, Ser. No. 958,596
Claims priority, application Fed. Rep. of Germany, Jun. 13, 1978, 2825820
Int. Cl.[2] B25B *1/02*
U.S. Cl. 269—203 **9 Claims**

1. A clamp comprising, in combination, an elongated rail having a pair of opposite side faces and a trough-shaped recess with an arcuate cross-section formed longitudinally in at least one of said side faces, a stationary jaw formed at one end of the rail perpendicular thereto, a slider arm having an opening formed therein for receiving the rail whereby said arm is slidably adjustable on the rail, a movable jaw mounted on said slider arm for gripping a workpiece between the jaws, said arm opening having a pair of opposed sides and at least one slot enlargement formed in a side adjacent the trough-shaped recess, and an elongated locking element having a planar base loosely fitted in the arm opening slot enlargement and trough-shaped recess with the said planar base seated in the trough-shaped recess whereby clamping pressure exerted on the jaws pivots the arm and twists the locking member such that the locking member planar base laterally engages the wall of the trough-shaped recess to lock the arm on the rail.



4,183,514
SYSTEM FOR SPREADING FLEXIBLE MATERIAL
Joseph W. A. Off, Irving, and Judson H. Early, Dallas, both of Tex., assignors to Haggar Company, Dallas, Tex.
Filed Jun. 23, 1978, Ser. No. 918,649
Int. Cl.[2] B65H *29/46*
U.S. Cl. 270—31 **31 Claims**



1. A system for spreading material from a bolt of material, which comprises:

a spreading portion including fixed table means of predetermined length, carriage means supported for selectively reciprocable movement over the table for depositing material from the bolt of material carried by the carriage means in successive layers over the table means, and first and second catcher cutter means mounted in spaced relationship on the table with each of said catcher cutter means including pivotal catcher bars for selectively engaging and then severing each end loop of material formed upon direction reversal of the carriage means;

a storage and loading portion including conveyor means for storing a plurality of bolts of material, and elevator means for transporting individual bolts of material received from the conveyor means into proximity with the carriage

means to selectively effect reloading of the carriage means after depletion of the bolt of material carried thereby; and processing means coupled to the spreading portion and the storage and loading portion for controlling operation of the system.

2. In a system for spreading material from a bolt of material carried by a carriage mounted for reciprocable movement over a fixed table, the improvement comprising:

an S shaped scray mounted on the carriage, said material being fed into the scray from the bolt of material and forming a loop therein before exiting the scray to be spread over the table;

a pair of output rollers supported on the carriage between the scray and the table;

said output rollers being selectively supported at a predetermined height over the table responsive to a preselected number of reciprocations of the carriage thereon;

photosensor means positioned substantially vertically adjacent the scray for detecting the length of the material loop and thus the amount of material maintained in the scray;

said material feed rate of input into the scray and material spread rate of output from the scray both being responsive to the photosensor means so as to maintain a tensionless loop in the material during the spreading operation; and

a pair of catcher means responsive to positioning of the carriage and mounted in spaced relationship along the table for catching and subsequently severing the end loops of material formed with each reversal of the carriage.

21. A method of spreading flexible material from a supply roll in successive layers over a spreading surface, comprising the steps of:

(a) a rotatably supporting a supply roll on a movable carriage;

(b) reciprocating the carriage over the spreading surface;

(c) continuously sensing the position of the carriage along the spreading surface;

(d) simultaneously advancing material from the supply roll on the carriage;

(e) maintaining a tensionless loop in the material advanced from the supply roll;

(f) guiding and releasing the material advanced from the supply roll a variable predetermined distance above the spreading surface;

(g) continuously sensing the length of the tensionless loop;

(h) engaging the end loops of material formed with each turnaround of the carriage;

(i) subsequently individually severing the end loops of material to disconnect each layer from the supply roll; and

(j) controlling both movement of the carriage and advancement of material from the supply roll in accordance with the position of the carriage and the length of the tensionless loop.

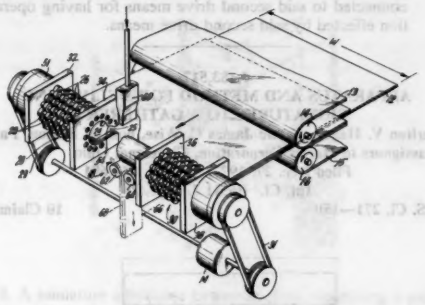
4,183,515

BAG FOLDING MACHINE

John B. Coast, Baton Rouge, La., assignor to Union Carbide Corporation, New York, N.Y.

Filed Jun. 28, 1978, Ser. No. 920,130
Int. Cl.² B65H *45/18*
U.S. Cl. 270—83 **7 Claims**

1. In a machine for producing folded flexible sheet material, such as plastic bags, having rolling means for rolling the material into a roll and means for removing the rolled material from said rolling means in a flattened condition, wherein said rolling means comprises; a rolling section arranged in an arc circumscribing a minimum of 270° of a circle for forming a cul-de-sac having a moving curved surface through at least a substantial portion of said 270°, with said rolling section being divided into at least two laterally disposed sub-sections spaced apart so as to provide a predetermined unobstructed open area therebetween, with each sub-section having an entrance opening for receiving said material; and means for driving each sub-section at a common speed sufficient to cause said material to wind about said moving curved surface into said roll, the improvement which comprises: said means for removing the rolled material being arranged relative to said open area to establish a discharge path through said open area in a predetermined direction normal to the longitudinal axis of said rolled material; with each entrance opening having a first flat surface located on opposite sides of said open area in a common plane lying transverse to and substantially normal to said predetermined



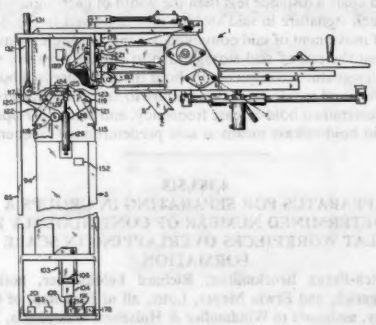
discharge path and a second surface spaced a predetermined distance apart from said first surface to provide a substantial clearance for conversion of the rolled material from a tubular to an oval shape during withdrawal with said first surface being disposed relative to said removal means such that said rolled material upon withdrawal is drawn over said first flat surface.

4,183,516

BLANK FEEDING APPARATUS

Jerry W. Young, Weston, Mo., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed May 18, 1977, Ser. No. 798,044
Int. Cl.² B65H *5/22*
U.S. Cl. 271—3.1 **22 Claims**



1. An apparatus for feeding side wall blanks from a source to a point of use, said apparatus including:

(a) a support member;

(b) a first arm means pivotally mounted on said support member and having a free end;

(c) a second arm means pivotally mounted on said support member and spaced from said first arm means and having a free end;

(d) a first member pivotally connected to said first arm means and second arm means adjacent the respective free ends;

(e) a feed member mounted on said first arm means and movable with said first arm means, said feed member

having a portion spaced from a portion of said first member forming a side wall blank receiving throat therebetween, first drive means, said feed member being operably connected to said first drive means for having operation effected by said first drive means;

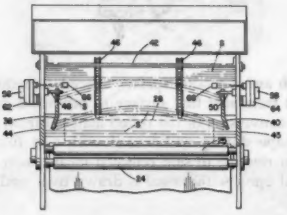
(f) conveying means positioned adjacent said feed member and being operable for conveying to a point of use a side wall blank fed by the feed member through the throat, second drive means, said conveying means being operably connected to said second drive means for having operation effected by said second drive means.

4,183,517

APPARATUS AND METHOD FOR DELIVERING SIGNATURES TO A GATHERER

Carlton V. Hageman, and James C. Wise, both of Easton, Pa., assignors to Harris Corporation, Cleveland, Ohio

Filed Dec. 27, 1977, Ser. No. 864,681
Int. Cl.[2] B65H *1/02, 1/24*
U.S. Cl. 271—150 **10 Claims**



1. Apparatus for delivering signatures to a feed mechanism, said apparatus comprising means defining a discharge area for signatures from which said signatures are fed by said feed mechanism, means for receiving and conveying signatures in a generally vertically stacked on-edge array to said area, side guide means extending in the direction of movement of said conveying means and defining a storage area for signatures upstream of said discharge area, said side guide means being spaced apart a distance less than the width of each signature so that each signature in said storage area is bowed in the direction of movement of said conveying means, hold-release means adjacent the end of said storage area to engage opposite sides of each signature to sequentially hold the signature in a bowed condition and to release each signature to said discharge area at a predetermined hold-release frequency, and means for operating said hold-release means at said predetermined frequency.

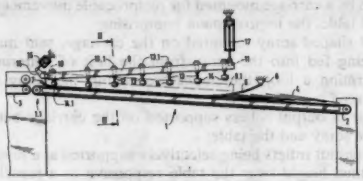
4,183,518

APPARATUS FOR SEPARATING IN GROUPS A PREDETERMINED NUMBER OF CONTINUOUSLY FED FLAT WORKPIECES OVERLAPPING IN SCALE FORMATION

Friedrich-Franz Brockmüller; Richard Feldkämper, both of Lengerich, and Erwin Meyer, Lotte, all of Fed. Rep. of Germany, assignors to Windmoller & Holscher, Westphalia, Fed. Rep. of Germany

Filed Nov. 10, 1977, Ser. No. 850,199
Claims priority, application Fed. Rep. of Germany, Nov. 12, 1976, 2651690
Int. Cl.[2] B65H *29/68*
U.S. Cl. 271—182 **7 Claims**

1. Apparatus for separating in groups a predetermined number of continuously fed flat workpieces, tube sections, empty sacks, bags or the like which are successively deposited on a belt conveyor and overlap one another in scale formation, the conveyor comprising individual parallel circulating belts, slide rails arranged between and substantially flush with the conveying runs, brake bands disposed one above each slide rail for effecting separation of the workpieces, the brake bands being movable between first and second positions, in the first positions the brake bands lying loosely on the slide rails so that workpieces can pass between the brake bands and the slide rails, in the second positions the brake bands being urged towards the rails to stop movement of the workpieces, weights



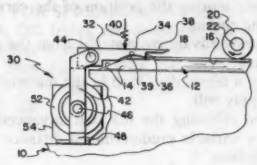
distributed lengthwise of the brake bands, longitudinal bars positioned above the brake bands for mounting the weights, and means for moving the bars toward the brake bands so that the weights are successively lowered onto the brake bands against the conveying direction thereby moving the brake bands into the second positions.

4,183,519

SHEET REGISTRATION MECHANISM

Willard C. Harris, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 21, 1978, Ser. No. 935,272
Int. Cl.[2] B65H *9/04*
U.S. Cl. 271—245 **6 Claims**



1. A mechanism for registering an edge of a document sheet relative to a surface of a platen in a copying apparatus, the mechanism comprising:

a registration member having an upper surface and a registration edge located at an angle to the upper surface;

means for positioning said registration member in (1) a first position wherein the upper surface is above the platen surface and the registration edge extends to the platen surface to register a document sheet on the platen and (2) a release position wherein the registration edge is separated from the platen surface and the upper surface is adjacent to the platen surface to form a continuation thereof so that a document sheet can be advanced across the upper surface as it is moved relative to the platen surface; and

means for moving said member to and from the respective positions.

4,183,520

EXERCISING DEVICE HAVING OPERABLY INTERCONNECTED PRIMARY AND SECONDARY PIVOT ARMS

Daniel F. Chase, 705 Willow, Apt. 3, Kelso, Wash. 98626

Filed Mar. 9, 1978, Ser. No. 884,918
Int. Cl.[2] A63B *21/00*
U.S. Cl. 272—130 **13 Claims**

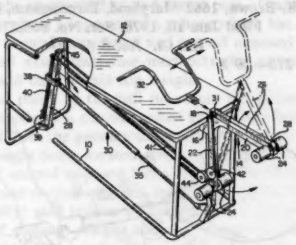
11. A physical exercise device comprising:

(a) a supportive frame;

(b) an elevated bed, located above said supportive frame for supporting a user;

(c) a main pivot arm pivotally connected to said bed at one end thereof, said main pivot arm including a first leg which is normally disposed generally parallel with respect to said bed, and a second leg which is generally perpendicular to said first leg;

(d) a secondary pivot arm pivotally attached at one end to the distal extremity of said first leg;



(e) first pulley means located on said second leg near the distal extremity thereof, second pulley means located on said frame adjacent to said first pulley means; and

(f) cable means attached at one end thereof to said secondary pivot arm, at the end thereof opposite the end attached to said first leg, extending around said first and second pulley means and attached at the other end thereof to the extremity of a lever arm.

4,183,521

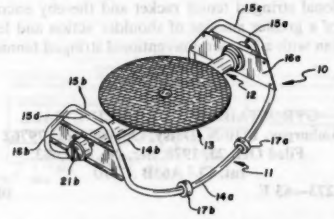
EXERCISING DEVICE

Delbert R. Kroeker, RR #1, Westboro, Wis. 54490

Filed Jan. 31, 1978, Ser. No. 873,793

Int. Cl.[2] A63B *7/00*

U.S. Cl. 272—146 **6 Claims**



1. An exercising device, said device including:

a. a supporting base including a pair of spaced, arcuately formed rockers, the rocking motion being in a first plane, said rockers being provided with generally upstanding ends joined to form a common end structure;

b. a cross bar member extending between the common end structures of the said rockers to lie within the plane of rocking motion of said rockers and being mounted for rotation transversely of the plane of rocking motion of said rockers; and,

c. a user support platform mounted for rotation on said cross bar member, the axis of rotation of said user platform being generally normal to the axis of said cross bar member.

4,183,522

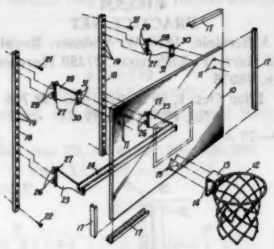
MINIATURE ADJUSTABLE BASKETBALL GOAL WITH APERTURED SUPPORT BARS

Alston H. Killen, Macon, Ga.

Filed Jan. 11, 1978, Ser. No. 868,676

Int. Cl.[2] A63B *63/04*

U.S. Cl. 273—1.5 R **9 Claims**



8. A miniature adjustable basketball goal comprising a pair of laterally spaced vertically extending apertured support bars, each having a plurality of apertures therein to provide for vertical adjustment, adapted to be mounted on a vertical support surface, a plurality of mounting brackets having suspension hooks for entry into apertures of the support bars, each of said brackets having a U-shaped notch in its upper surface, an upwardly opening channel member extending between said brackets and fitted into said notches, said channel member and brackets being rigidly secured to form a support unit, a backboard and a basketball goal carried by the backboard, the lower edge of said backboard being received in and continuously supported by said channel member in parallel spaced relation to said vertical support.

4,183,523

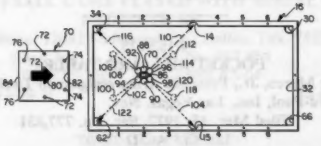
APPARATUS FOR FACILITATING THE PERFORMANCE OF BILLIARD SHOTS

Montague J. Hecht, Flushing, N.Y., assignor to Abel Calderon, New York, N.Y. part interest

Filed Jun. 9, 1977, Ser. No. 805,239

Int. Cl.[2] A63D *15/00*

U.S. Cl. 273—22 **5 Claims**



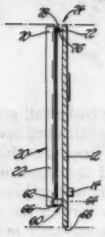
1. Apparatus for facilitating the performance of billiard shots involving a plurality of billiard balls, comprising a flat planar member configured and dimensioned to overlie a portion of the playing surface of a billiard table and support a plurality of billiard balls in such a manner that a first billiard ball advancing toward another ball resting on said planar member will strike the other ball before contacting said planar member; a plurality of marks indicating the placement of billiard balls being disposed on said planar member, said marks being positioned with respect to each other in such a manner that when each of said marks has one of said balls placed over it, and when one of said balls placed over one of said marks is struck by a single shot of said first ball, said single shot results in contact between said first and said one of said billiard balls before said first ball hits

said planar member, and all of the balls resting over said marks on said planar member are sunk in predetermined plural pockets of the billiard table with each of said pockets having at least one of said balls sunk therein as a result of said single shot; angular orientation means disposed on said planar member; and means for indicating the position of said planar member on said playing surface disposed on said planar member.

4,183,524
PRACTICE NET

Warren M. Kifferstein, 1510 W. Webster, Royal Oak, Mich. 48073, and Harry P. Kifferstein, 27250 Harvard Rd., Southfield, Mich. 48075

Filed Oct. 1, 1976, Ser. No. 728,744
Int. Cl.[2] A63B *69/38*
U.S. Cl. 273—29 A 6 Claims

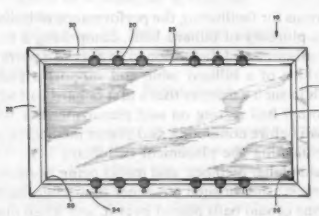


1. In combination with a building overhead door having an interior side and an exterior side and being capable of occupying a lowered closed position whereby said door has a lower edge disposed proximate to the ground and a raised open position whereby said lower edge is disposed away from the ground, a practice net for impacting by a ball and for rebounding said ball, said practice net comprising a substantially rectangular frame, a net, means for holding said net stretched within the periphery of said frame, hinge means pivotally attaching an end of said frame proximate to said lower edge of said overhead door and latching means removably fastening the other end of said frame to the interior side of said overhead door above said lower edge of said overhead door for maintaining said frame in a stored position in a plane substantially parallel to the interior side of said overhead door, said frame being suspended from said lower edge of said overhead door when said door is raised and said practice net is in use with said latching means unfastened.

4,183,525
POCKET BILLIARD TABLE

John De Marco, Jr., Prescott, Ariz., assignor to Twelve Pocket Billiard-Pool, Inc., Las Vegas, Nev.

Filed Mar. 15, 1977, Ser. No. 777,831
Int. Cl.[2] A63D *15/00*
U.S. Cl. 273—12 5 Claims

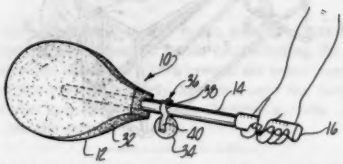


1. A pocket billiard table comprising a fully open, rectangular, flat and horizontal playing surface bordered by a cushioned edge extending therearound, said edge having a long pair and a short pair of opposite and parallel straight sides and four right angle corners at the intersection of said sides, and a plurality of at least four fully exposed pocket openings in said cushioned edge and spaced along each of said long pair and having no pockets in any of said corners nor along said short pair of sides.

4,183,526
TENNIS TRAINING DEVICE

Donald K. Brown, 1662 Maryland, Birmingham, Mich. 48009

Filed Jan. 10, 1978, Ser. No. 868,271
Int. Cl.[2] A63B *61/00*
U.S. Cl. 273—29 A 3 Claims

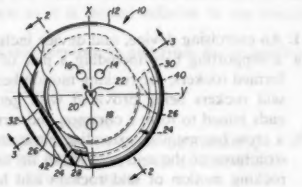


1. A tennis training device for use with a ball made of soft plastic foam, the combination comprising; a head member of relatively low density rigid plastic foam material having oppositely facing substantially imperforate ball engaging surfaces spaced apart in substantially parallel relation to each other and being of a size and shape substantially identical to that of a conventional stringed tennis racket, said head member being substantially imperforate, and a handle member of a relatively higher density material than said head member, said ball engaging surfaces being spaced apart a distance greater than the largest cross sectional dimension of said handle member, said handle member being attached to said head member in the space between and parallel to said ball engaging surfaces, said head and handle members having weights substantially equal to each other and providing a balance substantially the same as that of a conventional stringed tennis racket and a total weight substantially less than the weight of a conventional tennis racket, said substantially imperforate surfaces causing air resistance during swinging of said device simulating the swing of a conventional stringed tennis racket and thereby encouraging the use of a greater amount of shoulder action and less wrist action than with a heavier conventional stringed tennis racket.

4,183,527
GYROSTABILIZED BOWLING BALL

Jay D. Amburgey, 1710 N. Dotsy, Odessa, Tex. 79762

Filed Oct. 23, 1978, Ser. No. 953,683
Int. Cl.[2] A63B *37/10*
U.S. Cl. 273—63 E 10 Claims



1. A solid bowling ball having a core of relatively low density, a main body of a relatively medium density; means forming indicia on the outer surface of said ball at a location which describes the vertical axial centerline of said ball, a top weight of relatively high density; said top weight being positioned in

underlying relationship respective to said indicia and offsetting the loss in weight resulting from the subsequent formation of finger holes;

said core being centrally located within said main body and having an outer surface which is spaced from the outer surface of said main body so that the entire core is located within said main body;

said core being a segmented sphere wherein opposed portions of the surface of the core are cut off by spaced parallel planes to leave first and second opposed bases which lie parallel to said vertical axial centerline;

said top weight is attached to and forms part of said core, said top weight is a segment of a sphere which has a base positioned normal to said first and second opposed bases; said vertical axial centerline intersects the geometrical center of said base of said top weight;

the equatorial plane of the ball intersects the geometrical center thereof and is circumscribed equidistant from said indicia and from the geometrical center of said core; all of said top weight being located above said equatorial plane;

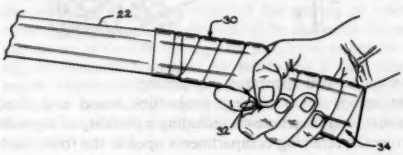
said first and second opposed bases provide the main body with first and second opposed masses of a relatively medium density; said indicia being formed to indicate the location of said top weight and the location of said first and second bases whereby finger holes may be formed in said main body at said top weight so that when the ball is rolled to describe a rolling plane which is parallel to said first and second bases, the first and second opposed masses produce a gyroscopic effect.

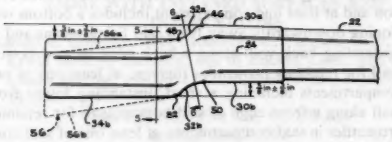
4,183,528

NATURAL PHYSIOLOGICAL GRIP FOR GAME RACKETS

Benjamin J. An, 2520 Bunker Hill, Ann Arbor, Mich. 48105

Filed Jan. 26, 1978, Ser. No. 872,492
Int. Cl.[2] A63B *49/08*
U.S. Cl. 273—75 **10 Claims**





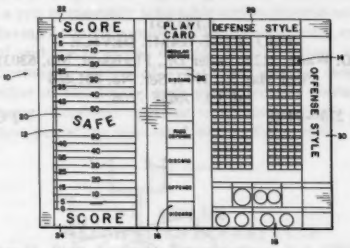
1. A grip for articles such as tools or sporting equipment adapted to be held by the human hand, said grip comprising an elongated member having a longitudinal axis and including front, intermediate and rear portions, said portions having upper, lower, and opposite side surfaces, the upper surface of said front portion being located above said longitudinal axis, the upper surface of said intermediate portion extending rearwardly from said upper surface of said front portion and the upper surface of said rear portion extending rearwardly from the upper surface of said intermediate portion, the upper surface of said rear portion being substantially parallel to said longitudinal axis and terminating at the end of said grip, the entire upper surface of said rear portion being located not higher than the upper surface of said front portion and not lower than said longitudinal axis, the lower surface of said front section being located below said longitudinal axis and the lower surface of said rear portion extending rearwardly below the lower surface of said front portion, the lower surface of said rear portion being substantially parallel to said longitudinal axis and terminating at the end of said grip, said surfaces being longitudinally dimensioned so that said intermediate portion can be grasped by the index finger and the thumb with the portion of the hand between the thumb and the index finger engaging said intermediate portion and said rear portion can be grasped by the middle, ring and little fingers and the palm of the hand.

4,183,529

FOOTBALL GAME

Charles D. Hynson, 507 N. Roosevelt, Sand Springs, Okla. 74063

Filed Jun. 30, 1978, Ser. No. 920,659
Int. Cl.[2] A63F *3/00, 7/06*
U.S. Cl. 273—94 R **10 Claims**



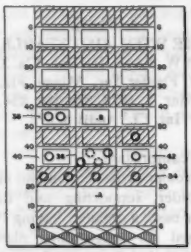
1. A board-type football game comprising a game board having a football field inscribed thereon, a play result tabulation table inscribed on the game board, a plurality of offense style cards adapted to be selectively positioned in combination with the play result tabulation table, a plurality of defense style cards adapted to be selectively positioned in combination with the play result tabulation table for cooperation with the table and the offense style cards to determine the end result of the individual plays during the playing of the game whereby the overall play of the game closely resembles an actual football game.

4,183,530

FOOTBALL GAME PLAYED WITH AERIAL PROJECTILES

Stephen S. Roop, 12032 Fieldwood La., Dallas, Tex. 75234

Filed Jun. 2, 1978, Ser. No. 911,884
Int. Cl.[2] A63F *7/06*; A63B *67/04*
U.S. Cl. 273—94 R **13 Claims**



1. Football game apparatus comprising:

(a) a game board having thereon a visual representation of a

football field including spaced lines representing at least one end zone and ten yard intervals,

(b) a plurality of first equal areas spaced within said ten yard intervals and said end zone visually representing designated defensive areas for short passes,

(c) a plurality of second equal areas smaller than and located within designated ones of said first areas and representing designated defensive areas for long passes,

(d) at least one offensive play action means for being cast at said gameboard by an offensive player whereby the location of said offensive play action means on said gameboard determines the movement of said offensive player toward said end zone and

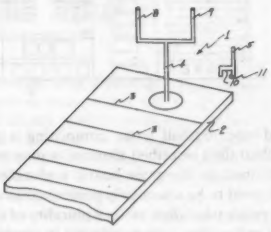
(e) a plurality of defensive means adapted to rest in selected ones of said first and second areas whereby, if an offensive play action means lands within an area bounded by said defensive means, a turnover is created and the defensive player becomes the offensive player.

4,183,531

FOOTBALL GAME DEVICE

Gerald D. White, 2125 Collier Dr., Florissant, Mo. 63031

Filed May 31, 1977, Ser. No. 801,469
Int. Cl.[2] A63F *7/06*
U.S. Cl. 273—94 R **2 Claims**



2. A football game device comprising,

a playing board provided with football field indicia marked thereon including yard lines and goal lines,

a goal post operably mounted on said board,

marking means, for football position measurement, said marking means comprising a pair of elongated members disposed in approximate parallel relationship to each other and joined together by a third member spanning the space between said members and attached to each such member, and

a projectile, said projectile in the form of a partially flattened band.

4,183,532

FLIPPER GAME WITH ADJUSTABLE DETAINER

Benito Iglesias, 3165 W. 8 Ave., Hialeah, Fla. 33012, and Jose R. Garcia, 3885 NW. Flagler Ter., Miami, Fla. 33144

Filed Mar. 7, 1978, Ser. No. 884,146
Int. Cl.[2] A63B *67/12*
U.S. Cl. 273—95 F **2 Claims**

1. A game outfit comprising:

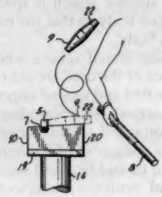
(a) a flipper of circular cross section and elongated shape;

(b) a flipper holder, supporting said flipper, having a grooved holder base, a detainer having flanges and being slidably engaged for longitudinal movement on said grooved flipper holder's top surface and said detainer being adjustably secured to said grooved base by a butterfly screw piercing said detainer through one of said flanges;

(c) a platform attached to said flipper holder;

(d) an adjustable stand engaged to said platform;

(e) a base supporting the lower end of said stand;



(f) a bat; and

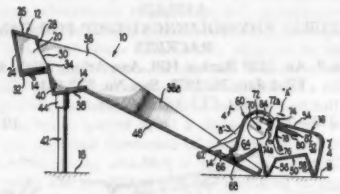
(g) a stopper racquet.

4,183,533

GAME WITH PIVOTING PROJECTOR AND TARGET COMPARTMENTS

Ralph J. Kulesza, Chicago; Joseph M. Burck, Glenview, and Horst-Dieter Herbstler, Bolingbrook, all of Ill., assignors to Marvin Glass & Associates, Chicago, Ill.

Filed Nov. 25, 1977, Ser. No. 855,009
Int. Cl.[2] A63B *67/06*
U.S. Cl. 273—101 **3 Claims**



1. An amusement apparatus, comprising:

target means for receiving projectiles aimed and fired thereat, said target means including a plurality of separate projectile retaining compartments open at the front, each compartment having a selected scoring value for projectiles fired and retained therein, wherein said compartments are aligned in a horizontal row in side-by-side relation and at least one compartment includes a bottom wall sloping downwardly away from said firing means and an upstanding back wall along a back edge of said bottom wall for retaining projectiles thereon, at least one of said compartments including a short upstanding lower front wall along a front edge of said bottom wall for retaining projectiles in said compartments, at least one of said compartments including a top wall and a depending upper front wall along a front edge thereof, said top wall sloping downwardly toward said front wall from an upper edge of said back wall, said compartment being open at the front between said upper and lower front walls for receiving projectiles;

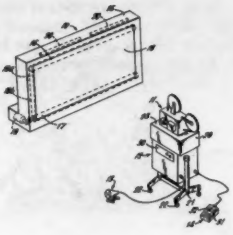
manually operable mobile firing means for forcefully propelling said projectiles toward selected compartments of said target means, said firing means including a body adapted to be supported in an upstanding position on a playing surface, a firing head pivotally mounted on said body, biasing means for moving an outer portion of said firing head to engage and fire a selected projectile toward said target means, and a trigger for releasing said biasing means to fire a projectile; and

means for maintaining said target means at an elevated level above said playing surface.

4,183,534
CONTROL APPARATUS FOR CONTROLLING A MOTION PICTURE TARGET APPARATUS

Anthony Simpson, 65 South Hill, Godalming, Surrey; Stuart M. Peterkin, 30 Leewood Way, Effingham, Surrey; Brian T. Brooksby, 156 Earlsbrook Rd., Redhill, Surrey, and Harold J. Murray, 32 New Odiham Rd., Alton, Hampshire, all of England

Filed Jun. 27, 1978, Ser. No. 919,713
Int. Cl.[2] F41J 9/14
U.S. Cl. 273—105.1 **14 Claims**

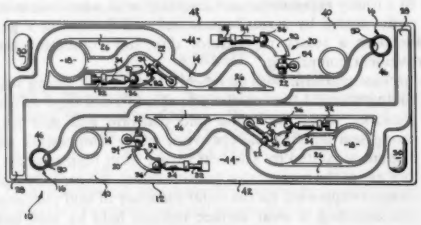


1. Control apparatus for controlling operation of a motion picture target apparatus having a screen, and a projector for projecting a motion picture film of a target image onto the screen, said control apparatus comprising means for storing or calculating for each of a plurality of different types of weapons the flight times and trajectories of a projectile for a plurality of range settings of the weapons, said means in use of the apparatus producing electrical outputs dependent upon flight time and trajectory; means for selecting the stored or calculated information relating to a particular weapon; means for selecting the range in accordance with the simulated range of the target image projected onto the screen; means responsive to the produced electrical output of the storing or calculating means dependent upon flight time of the projectile for stopping movement of the film through the projector; means for detecting the firing of a weapon for producing a start signal; and means responsive to the produced electrical output of the storing or calculating means dependent upon the trajectory of the projectile for moving the projected image on the screen vertically upward.

4,183,535
GAME WITH INCLINED SURFACES AND INTERCEPTORS

Adolph E. Goldfarb, 4614 Monarca Dr., Tarzana, Calif. 91356; Erwin Benkoe, deceased, late of Encino, Calif., and by Elisabeth Benkoe, executrix, 17965 Medley Dr., Encino, Calif. 91316

Filed Feb. 10, 1978, Ser. No. 876,645
Int. Cl.[2] A63F 7/02
U.S. Cl. 273—120 R **13 Claims**



1. A competitive play apparatus for competitive play by two players, where each player may generally simultaneously launch playing balls down that player's track while operating interception means to affect movement of playing balls on the opponent's track, said apparatus comprising:

(a) a frame having a pair of spaced apart, opposed player positions and defining a pair of upper playing surfaces, each surface having a starting end at one player position and extending longitudinally to an opposite end at the other player position, each surface being inclined downwardly from said starting end toward said opposite end, said surfaces being side-by-side with the starting end of each adjacent to the opposite end of the other;

(b) means on each of said surfaces defining a track for playing balls to roll along, said tracks each leading generally from the starting end of the associated surface toward the opposite end of that associated surface;

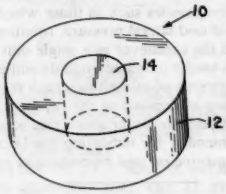
(c) a pair of interception means each disposed at a location intermediate the ends of one of said surfaces and adjacent to the said track on said associated surface, said interception means each being actuatable to affect the movement of a playing ball rolling along the associated track; and

(d) a pair of manually actuatable remote control means each having a control member located at the starting end of one of said tracks at one of said player positions and being operatively associated with the interception means at the other of said tracks, each of said remote control means being selectively operable to actuate for only a limited time period the associated interception means.

4,183,536
ILLUMINATED HOCKEY PUCK

Nicolas W. Platt, Loantaka Way, Madison, N.J. 07940

Filed Oct. 26, 1977, Ser. No. 845,490
Int. Cl.[2] A63B 71/00
U.S. Cl. 273—128 R **6 Claims**



1. A hockey puck comprising

a generally cylindrical impact member having an axially extending bore therethrough, said bore including a generally centrally disposed circular shoulder;

plug means releasably secured in said axially extending bore of said impact member, said plug means having an axially extending bore coaxial with said axially extending bore of said impact member, said plug means further including a relieved annular channel in its peripheral surface, said circular shoulder of said impact means and said annular channel of said plug means cooperating to define a releasable locking means for securing said plug within said impact member;

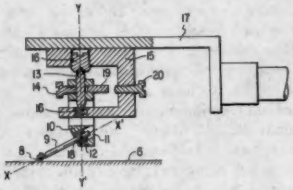
illumination means disposed within said plug means, said illumination means comprising a chemiluminescent light source including at least a first and a second chemiluminescent material which, when mixed, emit light incident to their interaction; and

a frangible barrier disposed in said axially extending bore of said plug means for separating at least of one said chemiluminescent materials from the other chemiluminescent material prior to mixing.

4,183,537
LATERAL PRESSURE DETECTOR FOR USE WITH A PHONOGRAPH RECORD PLAYER

Hisayoshi Nakatsuka, Mitaka, Japan, assignor to Namiki Precision Jewel Co., Ltd., Tokyo, Japan

Filed Dec. 12, 1977, Ser. No. 859,537
Claims priority, application Japan, Jan. 14, 1977, 52-3077
Int. Cl.[2] G11B *3/00*
U.S. Cl. 274—1 R **7 Claims**



1. A pick up lateral pressure detector detachably mountable on the tone arm of a phonograph record player, said detector comprising

a base detachably mountable with respect to said tone arm;

a pivotal member so mounted with respect to said base that the axis of rotation thereof is substantially perpendicular to the surface of the phonograph record;

a cantilever being mounted at substantially only one point with respect to said pivotal member, said one point being a fulcrum which facilitates the oscillation of said cantilever with respect to said pivotal member at least in a direction substantially parallel to said phonograph record surface, and where the mass of said pivotal member is substantially greater than that of said cantilever so that, at audio frequencies, said oscillation of the cantilever with respect to the pivotal member occurs without rotation of the pivotal member while, at frequencies substantially less than audio frequencies such as those which occur during application of said lateral pressure, rotation of the pivotal member and the cantilever as a single unit occurs;

a reproduction needle mounted on said cantilever adapted to engage the groove of said phonograph record; and

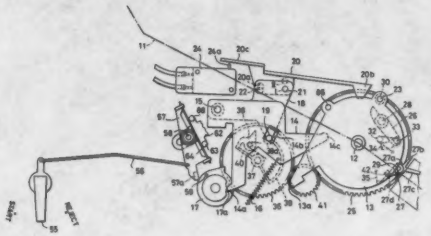
indicating means responsive to the rotation of said pivotal member and said cantilever about said axis of rotation of the pivotal member for indicating the lateral pressure of said record groove on said reproduction needle.

4,183,538
AUTOMATIC RECORD PLAYING APPARATUS

Takashi Saito, Yokohama, Japan, assignor to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Apr. 27, 1977, Ser. No. 791,595
Claims priority, application Japan, Apr. 30, 1976, 51-54627; Apr. 30, 1976, 51-54628; Apr. 30, 1976, 51-54629; Apr. 30, 1976, 51-54630
Int. Cl.[2] G11B *17/06*
U.S. Cl. 274—15 R **3 Claims**

1. An improved automatic record playing apparatus employing a rotatable turntable driven by a motor, and a rotatable tone arm associated therewith, the improvement comprising: a drive means; a first rotatable member rotated by the rotating force of the turntable upon operation of the drive means; a second rotatable member adapted to relate rotates together with the tone arm; said second rotatable member having a projection thereon; a third rotatable member rotatably separated from the second rotatable member, said third rotatable member being coaxially disposed with respect to the second rotatable member; means for translating and transmitting the rotational force of the first rotatable member to the third rotatable member for rotating the third rotatable member in forward and backward directions over a specific range; an engaging member provided on the third rotatable member, adapted to engage and push the projection to rotate the second rotatable member, for returning the tone arm unitarily therewith toward the outside of a record disc as the third rotatable member effects initial forward rotation, said engaging member having a first portion for contacting and pushing the projection in a forward rotational directional of the third rotatable member together with the rotation of the third rotatable member, and a second portion extending from the first portion tangentially to the direction of rotation of the third rotatable member; and an energizing member for energizing the engaging member

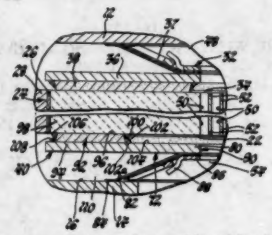


so that the second portion of the engaging member pushes the projection in a direction substantially perpendicular to the rotational direction of the second rotatable member, said second rotatable member being rotated by pushing the first portion of the engaging member to the projection, together with the rotation of the third rotatable member where a frictional force between the projection and second portion of the engaging member inhibits unnecessary fluctuation of rotation of the second rotatable member by pushing of the second portion against the projection in response to a pushing force of the energizing member.

4,183,539
SEAL HEAT SHIELD

James M. French, Plainfield, and Samuel R. Thrasher, Indianapolis, both of Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Nov. 13, 1978, Ser. No. 959,867
Int. Cl.[2] F28D *19/00*; F16J *15/34*
U.S. Cl. 277—22 **2 Claims**



1. In a rotary regenerator seal assembly with a hot side inlet and outlet sealed by a rim bypass seal and for use in a gas turbine with a rotary regenerator disc and combustor the improvement comprising:

an arcuate platform with an inboard edge, a leaf spring seal having one end thereon fixed to said inboard edge of the platform, means including said platform and said leaf spring seal defining therebetween a low temperature air plenum separated by said leaf spring from high temperature gas at the regenerator hot side outlet, a wear face seal element supported on the outer diameter of said platform and including a wear surface thereon held by said leaf spring seal in spring biased sealing relation with the hot side of the disc, said arcuate platform including an extension offset inboard of said seal element to define a flat plate

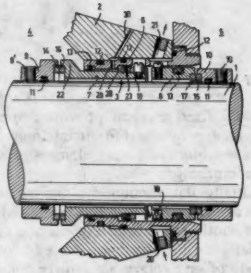
heat exchange segment for cooling said platform thereby to reduce conductive heat transfer through the platform from the inboard end thereof to the wear face seal element, said platform extension having an axial extent that shields the wear face seal element from infrared radiation produced at the combustor thereby to prevent excessive temperature build-up in the wear face seal element during gas turbine engine operations.

4,183,540

MECHANICAL SHAFT SEAL

Kauko Hytonen, Verajatie, Muurame 40950, Finland

Filed Sep. 12, 1978, Ser. No. 941,673
Claims priority, application Finland, Sep. 14, 1977, 772705
Int. Cl.[2] F16J *15/34, 15/40*
U.S. Cl. 277—27 **6 Claims**



1. A mechanical shaft seal for sealing the space between a rotable element and a stationary element so as to separate a pressure medium space from an external space, said shaft seal comprising at least one sealing ring, mounted on one of the elements, displaceable axially and sealing in relation to this element, and at least one counter-ring, mounted on the other element, positioned on the pressure space side of said sealing ring, and sealing in relation to this other element, sealing slide surfaces provided on said sealing ring and said counter-ring, said surfaces being pressed against each other axially, an intermediate space for a sealing fluid limited by one element and said sealing ring and said slide surfaces, and an annular shoulder provided on said sealing ring, by means of which shoulder the pressure of the pressure medium subjects the slide surface of the sealing ring to a closing force, which is higher than the opening force caused by the pressure of the pressure medium on said slide surfaces and tending to separate said slide surfaces from each other, characterized in that said sealing ring is provided with an annular piston sealing in relation to one element, said piston being subjected to the sealing fluid forcing the sealing ring towards said pressure medium space, whereby said piston is of such a size that the opening force caused by the pressure of the sealing fluid on said slide surfaces is lower than the closing force caused by said pressure of the sealing fluid and that the space of movement of the piston is by means of a channel connected with a space under pressure.

4,183,541

MECHANICAL SEAL ASSEMBLY

Robert S. Wentworth, Jr., Temecula, Calif., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Oct. 31, 1977, Ser. No. 847,204
Int. Cl.[2] F16J *15/30, 15/54*
U.S. Cl. 277—88 **1 Claim**

1. A mechanical seal assembly especially usuable in low temperature environments and adapted to be associated with a housing and a rotatable shaft, comprising:

a rotatable seal ring adapted to be connected to said shaft;

a stationary seal ring adapted to be connected to said housing;

said seal rings having engaging said faces;

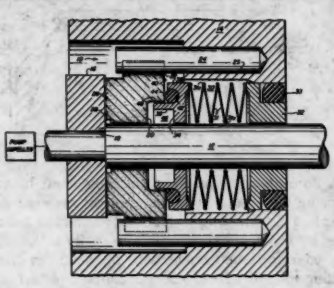
said stationary seal ring having a rearwardly extending, radially outwardly disposed flange portion;

a bellows resiliently urging said stationary seal ring toward said rotatable seal ring;

a bellows adapter ring between said shaft and said housing;

a bellows flange member radially spaced from said shaft;

said bellows being connected at one end to said adapter ring and at the other end to said bellows flange member;



said bellows flange member having two forwardly extending and radially spaced flange portions, one of which is of greater length than the other and which projects within said stationary seal ring flange portion;

said bellows flange member portions defining a cavity with a rearward face of said stationary seal ring; and

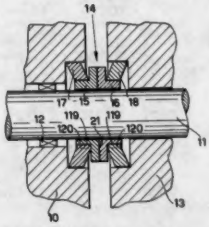
an elastomeric ring member in said cavity and being urged into engagement with said rearward face of said stationary seal ring by said bellows.

4,183,542

ROTATING FACE SEALING GASKET, PARTICULARLY FOR USE ON TRACKED VEHICLES

Patrizia Quartara, Turin, Italy, assignor to Fonderia R. Bertoldo & C. S.a.s., Turin, Italy

Filed Sep. 26, 1978, Ser. No. 947,339
Claims priority, application Italy, Oct. 21, 1977, 53586 A/77
Int. Cl.[2] F16J *15/38*
U.S. Cl. 277—92 **5 Claims**



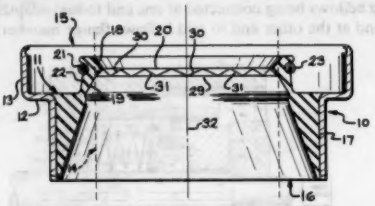
1. A rotating face sealing gasket, particularly for use on tracked vehicles, constituted by a pair of facing metal rings in mutual sliding contact, and a pair of rings of resilient material mounted on the outside of each metal ring and forming a seal one against a rotating surface and the other against a fixed surface of the vehicle, wherein the mutual slide-proof connection between each metal ring and the resilient ring rigid therewith is obtained by providing a plurality of ribs on the one to cooperate with an equal number of grooves in the other.

4,183,543

HYDRODYNAMIC SEAL WITH COLLECTOR BEAD

Joseph Antonini, Chicago, Ill., assignor to Dana Corporation, Toledo, Ohio

Filed Nov. 13, 1978, Ser. No. 959,632
Int. Cl.[2] F16J 15/32
U.S. Cl. 277—134 4 Claims



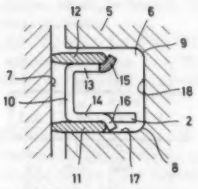
1. A liquid to gas seal for a rotatable shaft having an axis comprising an annular body of resilient material defining an annular liquid contacting surface and an annular gas contacting surface, said surfaces converging inwardly to form a circular sealing edge for engagement with the shaft, an annular bead projecting inwardly from said gas contacting surface a predetermined distance, and a plurality of spaced ribs projecting inwardly from said gas contacting surface a distance less than said predetermined distance and extending between said annular bead and said sealing edge, said ribs defining segments of substantially a conical helix, alternate ones of said ribs defining a first group of parallel ribs and the remaining alternate ribs defining a second group of parallel ribs, said first group of ribs extending in an equal and opposite angular direction to said second group of ribs with respect to the shaft axis, each of said ribs having a side toward said sealing edge forming a first angle to said gas contacting surface and having a side toward said bead forming a second and smaller angle to said gas contacting surface.

4,183,544

MULTI-PART PISTON OIL RING

Martin Morsbach, and Paul Johren, both of Burscheid, Fed. Rep. of Germany, assignors to Goetzewerke, Friedrich Goetze AG, Burscheid, Fed. Rep. of Germany

Filed May 4, 1978, Ser. No. 902,921
Claims priority, application Fed. Rep. of Germany, May 6, 1977, 2720297
Int. Cl.[2] F16J 9/00
U.S. Cl. 277—141 8 Claims



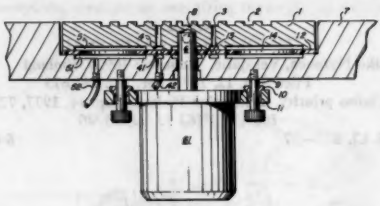
1. In a piston ring assembly including at least one cylinder-engaging rail and spacer-expander means composed of a sheet metal strip formed to have a profiled cross section and transversely slotted alternately from opposite sides to cause the strip to present a plurality of segments, the strip being curved into a circular form with the segments being spaced circumferentially therealong, the rail being supported by the spacer-expander means, the improvement wherein said spacer-expander means are further provided with a plurality of circumferentially spaced, inwardly radially directed spacer feet disposed at the inner circumference of said means.

4,183,545

ROTARY VACUUM-CHUCK USING NO ROTARY UNION

John K. Daly, Scottsdale, Ariz., assignor to Advanced Simiconductor Materials/America, Phoenix, Ariz.

Filed Jul. 28, 1978, Ser. No. 928,993
Int. Cl.[2] B23B 31/30
U.S. Cl. 279—3 2 Claims



1. In a rotary vacuum-chuck system having a rotary element with a work surface to which a workpiece is adhered by vacuum means and a fixed element providing support for said rotary element, an improvement for maintaining the vacuum to said work surface while said rotary element is in motion, said improvement comprising:

(a) a substantially flat vacuum sealing element emplaced between said rotary element and said fixed element and having a smooth, self-lubricating surface providing low friction, slidable contact support for said rotary element;

(b) on the side of said rotary element in contact with said sealing element, two radially spaced annular raised bearing surfaces defining a vacuum channel in close proximity to and concentric with the center of rotation of said rotary element, said vacuum channel being sized such that evacuation thereof improves the sealing contact of said raised bearing surfaces with said sealing element while permitting said rotary element to be rotated easily about its center of rotation, said sealing element having openings communicating with said vacuum channel;

(c) means for exhausting the air from said vacuum channel through said openings; and

(d) means for communicating the vacuum produced in said vacuum channel to said work surface such that a workpiece will adhere to said work surface.

4,183,546

SKATEBOARD

Morton L. Heilig, 855 Galloway Street, Pacific Palisades, Calif. 90272

Filed May 10, 1978, Ser. No. 904,601
Int. Cl.[2] A63C 17/00
U.S. Cl. 280—87.04 A 3 Claims

1. A skateboard comprising:

a board structure having a central portion with an upwardly facing deck surface on which a user may stand;

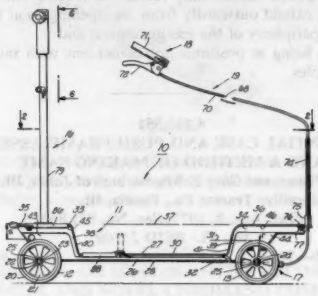
said board structure having front and rear portions which are at the front and rear ends respectively of said central portion, and which have upper surfaces higher than said deck surface of the central portion;

two front and rear pairs of wheels supporting said board structure and positioned beneath said front and rear portions respectively thereof, and which project upwardly to a level higher than said upwardly facing deck surface of the central portion of the board structure;

a forward truck assembly connected to the underside of said forward portion of the board structure and projecting downwardly therefrom and mounting said front pair of wheels for limited resiliently resisted swinging movement together relative to said forward portion of the board structure generally about a downwardly and rearwardly inclined axis;

a rear truck assembly connected to the underside of said rear portion of the board structure and projecting downwardly therefrom and mounting said rear pair of wheels for limited resiliently resisted swinging movement together relative to said rear portion of the board structure generally about a downwardly and forwardly inclined axis; and

a filler unit to be positioned on said central portion of the board structure and having an upper surface on which a



user may be supported and which is at a level higher than said deck surface of the central portion of the board structure but lower than said upper surfaces of said front and rear portions of the board structure;

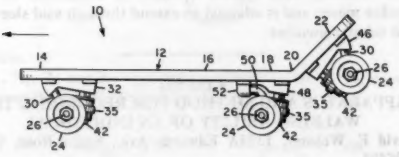
said filler unit having undersurface areas engageable downwardly against said deck surface of the central portion of the board structure to support it thereon, and having flanges projecting downwardly at opposite sides of said central portion to retain the filler unit laterally.

4,183,547

WHEELIE SKATEBOARD

Arthur Cohen, and Daniel R. Cohen, both of Port Washington, N.Y., assignors to Gustave Miller, Miami, Fla., a part interest

Filed Aug. 14, 1978, Ser. No. 933,149
Int. Cl.[2] A63C *17/04*
U.S. Cl. 280—87.04 A **3 Claims**



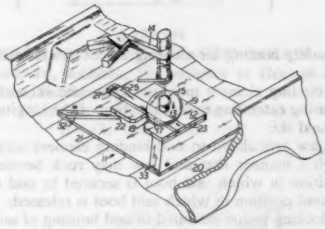
1. A wheelie skateboard (10) comprising an elongated platform for supporting a person, the platform having a forward end section (14), a longitudinal center line section (16) and a rear end section (18) in approximately the same plane with said forward and center line sections, and an inclined kicktail section (22) extending integrally upwardly and rearwardly from said platform end section (18) and merging (20) smoothly therewith, a first pair of wheels (24) and a common axle (26) coupled to and positioned on a forward truck (32) secured beneath said platform forward end section (14), a second pair of wheels and a common axle therefor coupled to and positioned on an intermediate truck (44 or 48) secured beneath said platform (12) rearward end section (18), and a third pair of wheels and a common axle therefor coupled to and positioned beneath a kicktail truck 46 secured to said kicktail section (22), all said axles being mounted on said trucks, said axle for said first pair of wheels having a truck pivot bolt (42) rearward of its said axle, said axle for said third pair of wheels on said kicktail section having a truck pivot bolt forward of its said axle, and said second pair of wheels having its axle mounted forward of its pivot bolt, and means substantially preventing said axle of said second pair of wheels from swivelling about its pivot bolt, whereby a person positioned on said platform forward of said kicktail section may ride supported on said first and second pair of wheels, or, positioned partly on said kicktail section, may ride on said skateboard supported on said second and third pairs of wheels.

4,183,548

TRAILER HITCH WITH AN INTERCHANGEABLE ROTATIVE PORTION

Raymond C. Schneckloth, Rte. 2, Clinton, Iowa 52732

Filed Sep. 21, 1978, Ser. No. 944,358
Int. Cl.[2] B62D *53/08*
U.S. Cl. 280—433 **4 Claims**



1. A trailer hitch comprising:

a base plate,

a pair of spacing bars having lower sides secured to said base plate and being spaced apart to have opposite inner edges separated a predetermined distance,

a hold-down member, at least one of said spacing bars having an upper side to which said hold-down member is rigidly secured, said hold-down member extending parallel to said base plate toward the opposite one of said spacing bars to provide a predetermined spacing between said hold-down member and said base plate, said base plate having an extending portion extending in the longitudinal direction of said spacing bars a substantial distance beyond said spacing bars and said hold-down member,

a fifth-wheel coupler having a disk and a connecting shaft, the disk having a diameter slightly less than said predetermined distance between said spacing bars and a thickness slightly less than said predetermined spacing, said disk being connected perpendicularly to a lower end of said connecting shaft such that said disk can be positioned flatly on said base plate, said disk being a sliding fit between said hold-down member and said base plate to facilitate sliding said disk from a position on said extending portion to a coupled position where said disk rests on said base plate between said spacing bars and is contained closely by said hold-down plate, said disk in said coupled position being retained laterally by said spacing bars but being easily rotatable therebetween,

said connecting shaft extending upwardly from the center of said disk, said hold-down member being shaped to provide midway between said spacing bars a passageway through which said shaft can pass from a position over said extending portion of said base plate to a position where said disk is in said coupled position,

retaining means fastened to said base plate against which said fifth-wheel coupler bears to retain it longitudinally between said retaining bars in said coupled position, and

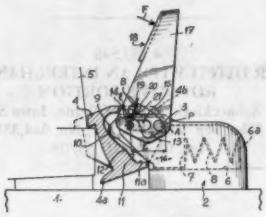
means connected to said shaft for coupling to an arm of a trailer hitch.

4,183,549

SAFETY BINDING WITH MANUAL RELEASE

Georges P. J. Salomon, Annecy, France, assignor to Etablissements Francois Salomon et Fils, Annecy, France

Filed Jan. 14, 1977, Ser. No. 759,406
Claims priority, application France, Jan. 16, 1976, 76 01102
Int. Cl.[2] A63C *9/084*
U.S. Cl. 280—632 **15 Claims**



1. A safety binding for securing a boot to a ski and comprising:

(a) a binding element mounted upon said ski and having a housing extending in the direction of the longitudinal axis of said ski;

(b) a jaw articulated to said binding element on an axle in such a manner that said jaw may rock between a first position in which said boot is secured to said ski, and a second position in which said boot is released;

(c) a locking piston mounted in said housing of said binding element in such a manner that said piston may slide in the direction of the longitudinal axis of said ski, said piston being urged, by means of a spring interposed between said binding element and said piston, in the direction of a releasing ramp arranged upon said jaw; and

(d) a manual release lever which, from a neutral position corresponding to the locked binding position in which said piston is in contact with said jaw-releasing ramp, may be moved downwardly in the direction of said ski, thereby causing said piston to move back in said housing against the action of said spring,

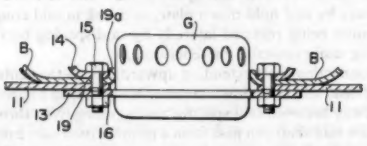
(e) said lever being pivotably connected to said locking piston and having a portion slidably bearing upon a reaction part associated with a binding member other than said locking piston.

4,183,550

AIR BAG HOLDING MEANS IN AN INFLATING TYPE OCCUPANT RESTRAINT DEVICE

Yoniichi Sudou, Toyota, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Apr. 6, 1978, Ser. No. 894,154
Claims priority, application Japan, Dec. 29, 1977, 53-92
Int. Cl.[2] B60R *21/08*
U.S. Cl. 280—743 **4 Claims**



1. In an inflatable passenger restraint device having an air bag having a substantially circular opening in the central region thereof and fixing bolt holes radially outwardly of said central opening, a gas generator, substantially circular in transverse cross-section, in the opening, a retainer for mounting the air bag and a securing member for securing the air bag and the gas generator, means extending through the fixing bolt holes for securing said air bag and said gas generator together with the retainer and the securing member, the improvement comprising:

the diameter of the opening of the air bag being less than the outer diameter of the gas generator, the inner edge of the bag surrounding the opening extending radially inwardly from the retainer and having a plurality of circumferentially spaced substantially radially extending slits therein which extend outwardly from the opening to at least the outer periphery of the gas generator; and

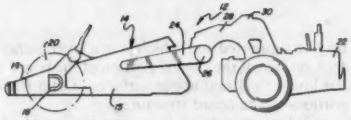
said slits being at positions not coincident with said fixing bolt holes.

4,183,551

DIFFERENTIAL CASE AND PUSH-FRAME ASSEMBLY AND A METHOD OF MAKING SAME

George A. Fisher, and Gary E. Mason, both of Joliet, Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Aug. 8, 1977, Ser. No. 822,843
Int. Cl.[2] B62D *25/00*
U.S. Cl. 280—785 **9 Claims**



3. A push frame assembly for a scraper bowl having an ejector cylinder, said assembly comprising a tubular structural member having a sleeve extending therethrough in a direction transverse to the longitudinal axis of said member, a pair of spaced apart side walls, each side wall having an aperture therethrough, the opposite end portions of said tubular member extending through said apertures and being connected directly to said side walls, a spreader tube connected directly to upwardly projecting portions of said spaced apart side walls, a rear plate connected directly to portions of the side walls remote from said spreader tube, and bracket means carried by the push frame and adapted to pivotally receive one end of said ejector cylinder, said bracket means is supported on said rear plate whereby said ejector cylinder is connected to said bracket means and is adapted to extend through said sleeve in said tubular member.

4,183,552

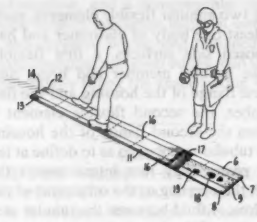
APPARATUS AND METHOD FOR RECORDING THE WALKING ABILITY OF AN INDIVIDUAL

David F. Webster, 1325A Edwards Ave., Santa Rosa, Calif. 95401

Continuation-in-part of Ser. No. 773,683, Mar. 22, 1977, abandoned. This application Dec. 19, 1977, Ser. No. 862,093
Int. Cl.[2] B41L *1/00*
U.S. Cl. 282—1 B **13 Claims**

1. A walking test device comprising an upper sheet having a central area thereon defining at least one walkway, marginal areas on either side of said at least one walkway, intermediate ink transfer means disposed only beneath the walkway on the upper sheet, a second sheet having an adhesive coated area thereon positioned below the upper sheet only in the area of said second sheet located beneath said walkway, the areas on said second sheet disposed beneath said upper sheet marginal areas being free of adhesive, said adhesive permanently receiving impressions imparted by the pressure of a walker's foot in the walkway on the upper sheet and transferred from the intermediate ink transfer surface, said areas on said second sheet which are free of adhesive not forming any impression of any portion of a walker's foot contacting said upper sheet marginal areas so that only that portion of a walker's foot

which contacts said walkway will be recorded on said second sheet to thereby form a permanent record of a walker's ability



to walk a straight line as such walker traverses said upper sheet during a walking test, and a removable protective sheet over said adhesive coated surface.

4,183,553

PRESSURE- OR HEAT-SENSITIVE RECORDING MATERIAL AND NOVEL CHROMANO COMPOUNDS USED THEREIN

Jean C. Petitpierre, Kaiseraugst, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

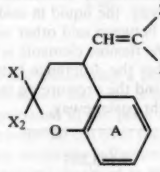
Filed Jan. 30, 1978, Ser. No. 873,628

Claims priority, application Switzerland, Feb. 4, 1977, 1380/77

Int. Cl.[2] **B41L** *1/20;* **C07D** *311/60*

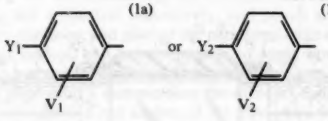
U.S. Cl. 282—27.5 **25 Claims**

1. A pressure- or heat-sensitive recording material which contains as color former at least one chromano compound, at least one electron acceptor, and at least one binder, said chromano compound being of the formula



wherein

X_1, X_2, Z_1 and Z_2, each independently of the other, represent the group of the formula



in which

V_1 and V_2, each independently of the other, represent hydrogen, halogen, lower alkyl or lower alkoxy, and

Y_1 and Y_2, each independently of the other, represent hydrogen, —O—R_1 or

and the ring A is unsubstituted or substituted by halogen, nitro, lower alkyl, —O—R_3 or

or contains a fused benzene ring,

whilst

R_1, R_2, R_3 and R_4, each independently of the other, represent hydrogen, alkyl of not more than 12 carbon atoms which is unsubstituted or substituted by halogen, hydroxyl cyano or lower alkoxy, or represent cycloalkyl, phenyl, benzyl, or phenyl or benzyl which is substituted by halogen, nitro, lower alkyl or lower alkoxy, or

each of the pair of substituents

R_1 and R_2 and R_3 and R_4, together with the nitrogen atom to which said pair is attached, independently represents a 5- or 6-membered heterocyclic radical.

4,183,554

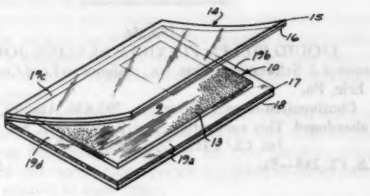
SEMI-LAMINATED SECURITY POUCH

Crit Howard, Jr., Addison, Ill., assignor to General Binding Corporation, Northbrook, Ill.

Filed Jan. 26, 1978, Ser. No. 872,442

Int. Cl.[2] **G09F** *3/03, 3/04*

U.S. Cl. 283—7 **9 Claims**



1. A semi-laminated tamper proof identification card assembly, comprising:

(a) an identification card having identifying indicia on a front face and a glass bead security coating means on said front face for providing data alteration security which becomes substantially ineffective when a heat reactivatable adhesive layer is melted in contact therewith:

(b) transparent front and rear film leaves;

(c) a heat reactivatable adhesive layer on said rear leaf laminating the rear leaf to a rear surface of the card; and

(d) the front leaf being positioned over and in contact with but not laminated to the security coating means on the card and said front leaf not having a heat reactivatable adhesive layer in contact with the security coating means, said front leaf being bonded to the rear leaf by said heat reactivatable adhesive at peripheral portions of the front leaf substantially surrounding outer edges of the card, a bond promoting means being provided for adhering the front leaf peripheral portions to the heat reactivatable adhesive.

4,183,555

METHODS AND JOINTS FOR CONNECTING TUBULAR MEMBERS

Charles F. Martin, P.O. Box 197, Porter, Tex. 77365

Filed Apr. 2, 1976, Ser. No. 673,010

Int. Cl.[2] **F16L** *35/00*

U.S. Cl. 285—39 **62 Claims**

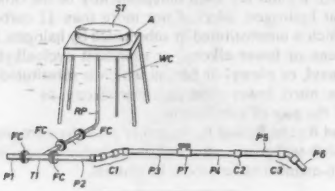
1. An assembly for connecting tubular bodies together comprising:

(a) first and second tubular bodies, each of which includes at least one end portion with an end opening in communica-

tion therewith, said first body end portion being receivable within said second body end opening to form an overlapping joint area;

(b) a longitudinally extending passage included in said first body in communication with said first body end opening;

(c) forging means receivable within said first body end opening for forging said first body laterally outwardly against said second body in said overlapping joint area to form a joint between said first and second bodies;



(d) indexing means for limiting axial inward movement of said first body into said second body;

(e) means to urge said first body into said second body and to effect engagement of said indexing means; and

(f) means operatively connected to said first and second bodies to restrain relative rotational movement of said first and second bodies and relative axial outward movement of said first body from said second body.

4,183,556

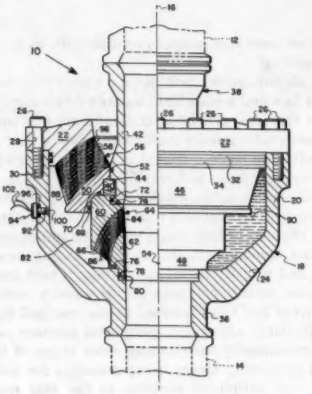
LIQUID FILLED FLEXIBLE SEALING JOINT

Leonard J. Schwemmer, Erie, Pa., assignor to Lord Corporation, Erie, Pa.

Continuation-in-part of Ser. No. 792,436, Apr. 29, 1977, abandoned. This application May 2, 1978, Ser. No. 902,144

Int. Cl.[2] **F16L** *27/02, 55/02, 57/00*

U.S. Cl. 285—51 **10 Claims**



1. In a joint assembly for interconnecting two conduits that receive fluid under a pressure different from an external ambient pressure on the conduits, said assembly comprising

a hollow annular housing having an opening at each end and including first and second annular flanges that extend radially inwardly relative to a maximum internal diameter of the housing, the two flanges being spaced apart along a longitudinal axis of the housing so that the first flange is closer to one end of the housing than to the other,

a tubular member of smaller external diameter than said maximum internal diameter of the housing, the tubular member including adjacent one end a flange which extends radially outwardly of said member and which is disposed between the two flanges of the housing, the other end of the tubular member projecting from the opening at the one end of the housing for attachment to a fluid conduit, and

means defining two annular flexible elements, each of which includes at least one body of elastomer and has a pair of annular exposed side surfaces, a first flexible element encircling the tubular member and being disposed between the first flange of the housing and the flange of the tubular member, the second flexible element being disposed between the second flange of the housing and the flange of the tubular member so as to define at least part of a fluid-tight passageway that interconnects the tubular member with the opening at the other end of the housing to permit a flow of fluid between the tubular member and said end opening of the housing, at least one of the two flexible elements also being disposed so as to resist through compression loading of its body of elastomer relative movements between the housing and the tubular member in at least one direction that is generally parallel to the longitudinal axis of the housing, relative pivotal movement between the housing and the tubular member about an axis transverse to the longitudinal axis of the housing being accommodated by deflection in shear of the body of elastomer of at least one flexible element,

at least the housing and the flexible elements being arranged to define within the housing an annular cavity that is separate from the fluid-tight passageway, one side surface of the first flexible element being presented to said external ambient pressure and the other side surface of the first flexible element being presented to said annular cavity, one side surface of the second flexible element being presented to the fluid-tight passageway and the other side surface of the second flexible element being presented to said annular cavity,

the improvement wherein said annular cavity is fluid-tight and wherein a quantity of substantially incompressible liquid fills said cavity, the liquid in said cavity serving to transmit pressure between said other sides of the flexible elements so that the flexible elements act in series to share loads resulting from the difference between the external ambient pressure and the pressure on the fluid in the conduits and fluid-tight passageway.

4,183,557

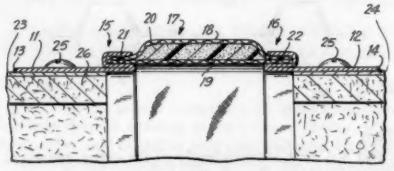
INSULATIVE FLEXIBLE CONNECTOR

Milton Hinden, Massapequa, N.Y., assignor to Duro Dyne Corporation, Farmingdale, N.Y.

Filed Feb. 15, 1978, Ser. No. 878,065

Int. Cl.[2] **F16L** *21/06, 59/14*

U.S. Cl. 285—53 **5 Claims**



1. As a new article of manufacture, an elongate supply of improved flexible connector stock material from which lengths are adapted to be cut for formation by transverse bending to the configuration of an air duct, comprising two elongated metal strips, substantially flat in transverse section, and an elongate composite web of air impervious insulation and vibration damping material secured therebetween, each said metal strip having a free marginal edge and a clamping marginal edge comprised of a folded over longitudinal marginal portion of said strip, said flexible web comprising upper and lower layers

of fabric defining a flattened tubular conformation, each of the side marginal edges of said upper and lower layers being clampingly crimped within said clamping marginal edge of one of said metal strips, thereby to maintain said layers in said tubular conformation, and a compressible, depthwisely resilient expansible strip of insulating material interposed between said layers and captured within said flattened tubular conformation by said clamping marginal edges, said strip of insulating material substantially filling the space within said tubular conformation.

4,183,558

METHOD FOR WELDING BY PRESSURE ONE OR MORE PIPES TO A PLATE IN ONE PROCESS

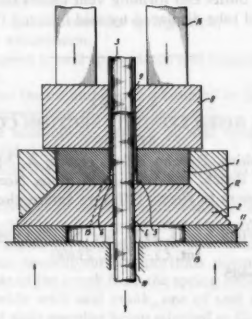
Johannus J. Broodman, Breskens, Netherlands, assignor to B.V.Koninklijke Maatschappij "De Schelde", Vlissingen, Netherlands

Filed Feb. 3, 1978, Ser. No. 874,773

Claims priority, application Netherlands, Oct. 12, 1977, 7711204

Int. Cl.[2] B23K *21/00*

U.S. Cl. 285—189 **4 Claims**



1. In the method for connecting a pipe to a plate by high pressure welding in which the pipe is inserted a certain distance into a bore provided in the plate and subsequently the material of the pipe is spread out over the wall surface defining the bore of the plate, under the influence of high pressure and with the aid of a mandrel disposed in the pipe, the improvement which comprises the steps of positioning within a cooperating punch and die set, the plate with an end section of the pipe inserted into the bore of the plate a distance less than the length of the bore, said punch and die set having opposed aligned bores accommodating the extension therethrough of the pipe and a mandrel respectively, said punch and die set generally confining said plate at the peripheral edge and opposite sides thereof, and being operable to apply compressive forces to said opposite sides of the plate; inserting said mandrel into the pipe such a distance that the mandrel extends completely through said end section of the pipe and a free end of the mandrel is located within the pipe and within one of said aligned bores of the punch and die set, said mandrel being slidable into the pipe with a close fit therewith; applying, with said punch and die set, compressive forces to said opposite sides of the plate, while said mandrel is inserted in the pipe, to deform the material of the plate in the region of the bore thereof and to deform the material of the pipe end section in said plate bore such that said plate material and pipe end section material are pressed against the mandrel; and, withdrawing the mandrel from the pipe and out of the bore of the plate while maintaining said compressive forces to spread out in the mandrel withdrawal direction and over a boundary surface portion of the plate bore, said deformed pipe end section material and thereby form a welded joint.

4. A joined-together pipe and plate product obtained by the method of claim 1.

4,183,559

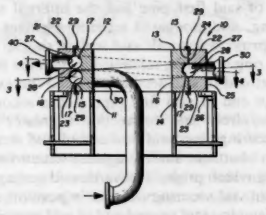
PIGGABLE FLUID SWIVEL

Donald C. Stafford, Hinsdale, and John S. Andrepont, Lisle, both of Ill., assignors to Chicago Bridge & Iron Company, Oak Brook, Ill.

Filed Feb. 6, 1978, Ser. No. 875,592

Int. Cl.[2] F16L *27/08*

U.S. Cl. 285—190 **28 Claims**



1. A fluid-swivel comprising:
a first member having a first face,
a second member having a second face adjoining and mating with the first face of the first member,
means operatively positioning and holding the first member and the second member to rotate relative to each other about a common axis and with the first face and second face positioned to rotate relative to each other in operative arrangement,
a fluid conduit defined by a first raceway in the first face and a second raceway in the second face, with said second raceway being exactly opposite the first raceway when the first and second raceways are at a predetermined index point relative to each other,
said fluid conduit at the indexed condition defining a path in one revolution about the common axis which advances the conduit a distance of at least one width of the conduit,
sealing means preventing fluid flow between the first face and the second face and thereby out of the fluid-swivel,
an inlet conduit communicating with the fluid conduit, and
an outlet conduit communicating with the fluid conduit.

4,183,560

ARRANGEMENT FOR MAKING A SPIGOT-AND-SOCKET JOINT SECURE FROM SLIDING

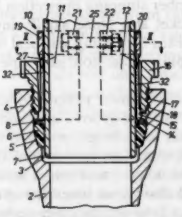
Walter Wyss, Matzendorf, Switzerland, assignor to H. Heer & Co., Olten, Switzerland

Filed Jan. 27, 1978, Ser. No. 872,774

Claims priority, application Switzerland, Jan. 27, 1977, 1003/77; Dec. 20, 1977, 15679/77

Int. Cl.[2] F16L *21/04*

U.S. Cl. 285—232 **19 Claims**



1. In a deflectable spigot and socket connection of the type

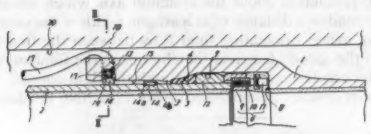
wherein the spigot end of a first pipe is held within and surrounded by the socket end of a second pipe, wherein a sealing ring is positioned between the external surface of the spigot end of said first pipe and the internal surface of the socket end of said second pipe to thereby form a fluid seal therebetween, wherein a securing ring is positioned between the external surface of the spigot end of said first pipe and the internal surface of the socket end of said second pipe, said securing ring having an end which projects towards said sealing ring and including means for fixedly positioning said securing ring with respect to the internal surface of the socket end of said second pipe, the improvement wherein an elongated sleeve-like securing element is positioned between the external surface of the spigot end of said first pipe and the internal surface of said securing ring, said elongated securing element having a first end which projects towards said sealing ring so as to maintain said sealing ring in sealing relationship with the internal surface of the socket end of said second pipe and the external surface of the spigot end of said first pipe, and a second end which extends away from said connection a greater distance than does said securing ring, said first end of said securing element including an abutment surface against which said end of said securing ring which projects towards said sealing ring abuts so as to maintain said securing element in position, and clamping means for clamping said second end of said securing element to the pipe which includes said spigot end, said securing ring and said securing element being so constructed and arranged so as to allow deflectability between said spigot and socket connection.

4,183,561

SEPARATION-PREVENTED PIPE JOINT WHICH CAN BE ASSEMBLED FROM INSIDE PIPE

Hiroshi Miyamoto; Tadao Yamaji; Toshi Nakajima, and Takao Sagara, all of Amagasaki, Japan, assignors to Kubota, Ltd., Osaka, Japan

Filed Dec. 29, 1977, Ser. No. 865,374
Claims priority, application Japan, Sep. 9, 1977, 52/109357
Int. Cl.[2] F16L *39/00*
U.S. Cl. 285—321 **12 Claims**



1. A separation-prevented pipe joint which can be assembled from inside the pipe, comprising a socket, a spigot inserted in said socket, a split lock ring fitted in an annular groove formed in the open end inner periphery of the socket said split lock ring being engageable with the outer peripheral surface of the spigot, a projection formed on the outer peripheral surface of the spigot so as to be engageable with said split lock ring axially from the inside, a seal member interposed between the outer peripheral surface of the spigot and a seal member supporting surface tapering from the inner side of the socket toward a seal member stopping projection formed on the inner surface of the socket at a place axially inwardly of said first projection, and means for urging said seal member toward said seal member stopping projection, said pipe joint being characterized in that

(a) the portion of the inner peripheral surface of the socket between said annular groove and said seal member stopping projection has a length equal to the sum of the axial width of said spigot projection and the distance for the allowable axial relative movement between the socket and the spigot and also has an inner diameter such that there is defined a space between the inner peripheral surface of the socket and the outer peripheral surface of said spigot projection;

(b) formed on the socket axially inwardly of said seal member supporting surface are an inner cylindrical surface defining a space for receiving said urging means and a radially inwardly extending innermost socket step surface which is continuous with said inner cylindrical surface and with which the end of said urging means engages;

(c) a relay ring is interposed between said seal member and said urging means to maintain a fixed distance therebetween so as to prevent disengagement between the outer peripheral surface of the spigot and the seal member during the axial relative movement between the socket and spigot; and

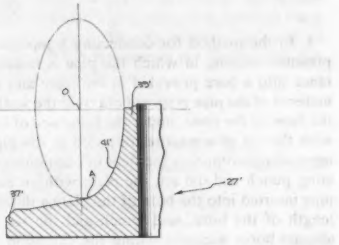
(d) means for preventing radial expansion of said lock ring from a fitted relation with the outer peripheral surface of the spigot and said annular groove comprises port means communicating with said annular groove from the outside of the socket, a flexible tube extending through said port means and interposed between the bottom of said annular groove and the outer peripheral surface of the lock ring, said flexible tube having inlet and outlet ends locatable in desired positions remotely of the pipe joint, and a filler which is injected in a fluid condition into said tube through said inlet end thereof and which thereafter solidifies, said outlet end forming vent means for the escape of air in said tube displaced by said injected filler.

4,183,562

MARINE RISER CONDUIT SECTION COUPLING MEANS

Bruce J. Watkins, Rancho Palos Verdes; A. Michael Regan, Huntington Beach, and William P. Slata, Northridge, all of Calif., assignors to Regan Offshore International, Inc., Torrance, Calif.

Filed Apr. 1, 1977, Ser. No. 783,636
Int. Cl.[2] F16L *23/00*
U.S. Cl. 285—405 **4 Claims**



1. A marine riser conduit section coupling adapted to withstand high rise tension and bending loads encountered in deep subsea well drilling and production operations comprising:

tubular portion means for connecting with the associated riser conduit section;

flange portion means for abutting connection with another coupling connected to its associated riser conduit section; and

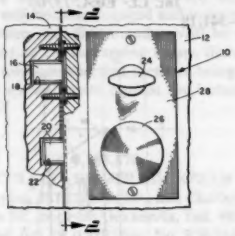
outer surface configuration means extending circumferentially about said coupling and extending from said tubular portion means to said flange portion means for preventing stress concentration in said coupling, wherein said outer surface configuration means comprises a curve defined by substantially a quarter of an ellipse which extends from near the extremity of the tubular portion means toward the radial extremity of the flange portion means, and wherein said ellipse has a major axis about twice the length of its minor axis, and said major axis is parallel to the axis of the riser conduit section.

4,183,563

PANIC-PROOF LOCKSET

William Stevens, Monroe, N.C., assignor to Scovill Manufacturing Company, Waterbury, Conn.

Filed Nov. 25, 1977, Ser. No. 854,862
Int. Cl.[2] E05B *63/14*
U.S. Cl. 292—34 **2 Claims**



1. In a panic-proof lockset comprising:
(a) a spring latch;
(b) a deadbolt spaced from the spring latch;
(c) an interior escutcheon;
(d) a knob coupled to said spring latch and supported by said escutcheon;
(e) a cam within the escutcheon and coupled to the knob and disposed intermediate the knob and latch;
(f) a rotatable thumbpiece carried by said escutcheon for operating said deadbolt;
(g) a crank inside the escutcheon and coupled to said thumbpiece;
(h) a reciprocable slide member within said escutcheon and movable by the cam in response to rotary motion of said knob to retract said spring latch, said slide member including first and second surface portions normally on the opposite side of the crank from the spring latch and which are engageable with said crank, one of said surface portions of said slide member being adapted as the slide member moves toward the latch to turn said crank clockwise to a position at which it points toward the latch and retracts said deadbolt, and the other of said surface portions being adapted as the slide member moves toward the latch to turn said crank counterclockwise to a position at which it points toward the latch and retracts said deadbolt,
the improvement wherein said surfaces are spaced apart wider than the width of the crank so that the end of the travel of the slide member toward the latch is not defined by engagement of the crank with both surface portions simultaneously, and wherein the slide member is slotted between the surfaces from one surface to the other, the slot extending with parallel margins from said surfaces in a direction away from the latch a distance such that the end of the travel of the slide member toward the latch is not defined by the engagement of the crank and the slide member at the end of the slot and the slide member amply clears the crank whereby in operation the latch is invariably retracted before the travel of the slide member toward the latch is blocked by the crank.

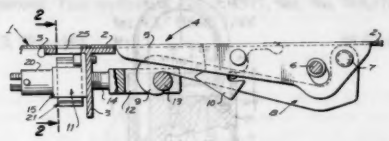
4,183,564

EXTERNALLY ACCESSIBLE ADJUSTER FOR FLUSH LATCHES

L. Richard Poe, Long Beach, Calif., assignor to Hartwell Corporation, Placentia, Calif.

Filed Mar. 1, 1978, Ser. No. 882,173
Int. Cl.[2] E05C *5/00*
U.S. Cl. 292—113 **5 Claims**

1. The combination with a flush type latch structure mounted in a panel set flush in a surrounding surface structure, an underlying mounting means, and an access opening adjacent the mounting means, the latch structure including a handle member movable in a clearance opening between a flush position and an angular position with respect to the panel, and a latch arm, of an adjustable keeper assembly, comprising:
a. a keeper element removably attached to the latch arm;
b. a screwthreaded shaft extending from the keeper element;
c. a guide means receiving the shaft and secured to the mounting means;
d. a wheel screwthreaded on the shaft and axially restrained by the guide means, the wheel having a ring of radially



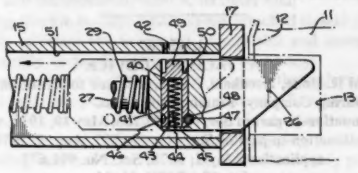
extending slots accessible in sequence through the access opening by a turning tool, whereby the wheel may be turned to advance or retract the keeper and latch arm while interengaged, said wheel having internal screwthreads spaced from the screwthreads of said shaft; and
e. frictional means for advancing or retracting the keeper and latch arm by rotating said wheel, said frictional means being positioned between said wheel and said internal shaft screwthreads.

4,183,565

LATCH BOLT LOCKING MECHANISM FOR FIRE DOOR LOCKSETS

James G. Allemann, South Gate, Calif., assignor to Norris Industries, Inc., South Gate, Calif.

Filed Aug. 28, 1978, Ser. No. 937,504
Int. Cl.[2] E05C *1/00, 13/02*
U.S. Cl. 292—163 **6 Claims**



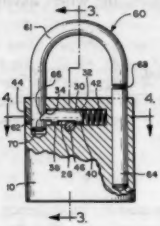
1. A locking mechanism for a latch bolt unit in a door for holding the latch bolt unit in engagement with the door when in extended position upon release of said mechanism and wherein there is a slideway in the door in which said latch bolt unit is reciprocatably mounted, a shoulder stationarily located on a portion of the door in communication with said slideway and latch bolt spring means acting between the latch bolt unit and the door biased in a direction to move said latch bolt unit to extended position, said mechanism including means forming a locking pin hole in said latch bolt unit which extends transversely of the latch bolt unit and in alignment with the shoulder when the latch bolt unit is in extended position, a locking pin reciprocatably mounted in said locking pin hole and locking pin spring means biased in a direction urging said locking pin laterally outwardly, a recess in said locking pin, means forming a release pin bore in said latch bolt unit in alignment with said recess in withdrawn position of the locking pin, and a release pin of fusible material in said release pin bore and extending into said recess acting to withhold said locking pin from engagement with said shoulder.

4,183,566

SEAL LOCK

Paul D. Yates, Prospect, Ohio, assignor to Hercules Industries, Inc., Prospect, Ohio

Filed Mar. 6, 1978, Ser. No. 883,521
Int. Cl.[2] B65D *27/30*
U.S. Cl. 292—317 **5 Claims**



1. A keyless lock comprising:

a shackle having first and second substantially parallel end sections, said first end section defining a notch;

a unitary lock body defining first and second substantially parallel receiving cavities positioned to receive the first and second end sections, respectively, and further defining a bolt cavity positioned to intersect the first receiving cavity;

a bolt slidably positioned in the bolt cavity, said bolt having a beveled end portion adjacent the first receiving cavity;

a spring disposed in the bolt cavity and operative to urge the bolt toward the first receiving cavity, said spring acting to hold the beveled end portion of the bolt in the notch in the first end section of the shackle when the shackle is inserted in the first and second receiving cavities;

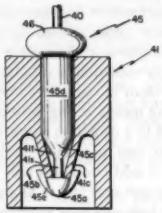
a bearing surface on said first end section adjacent the notch, which bearing surface operates to disengage the bolt from the notch when the first end section is rotated in the first receiving cavity, such that the first end section may be removed from the lock body after the shackle has been severed without deformation of the lock body.

4,183,567

ATTACHING DEVICE

Arnold R. Bone, Needham, Mass., assignor to Dennison Manufacturing Company, Framingham, Mass.

Continuation-in-part of Ser. No. 687,786, May 19, 1976, which is a continuation-in-part of Ser. No. 494,087, Aug. 2, 1974. This application May 1, 1978, Ser. No. 901,675
Int. Cl.[2] B65D *33/34*
U.S. Cl. 292—318 **10 Claims**



1. An attaching device comprising a socket having a cavity therein that extends from a mouth at one side through a plurality of prongs terminating in an opening, said prongs having interior and exterior surfaces;

and a filamentary member having one end connected to the socket and the other end connected to a head;

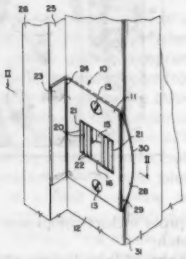
said head having appendages for gripping the exterior surfaces of said prongs when said head is inserted into said socket.

4,183,568

LOCK GUARD

Hugo F. Ferracane, 45 Vernon St., Patchoque, N.Y. 11772

Filed May 15, 1978, Ser. No. 905,998
Int. Cl.[2] E05C *13/00*
U.S. Cl. 292—341.18 **10 Claims**



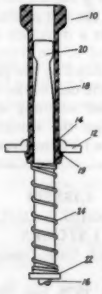
1. A security lock guard adapted to engage differently sized latch bolts and to be mounted overlying the recess on the door jamb, which comprises a unitary rigid plate provided with an opening for receiving said latch bolt and adjustable to the width of said latch bolt by means of at least one flange extending into said opening and forming horizontal slots with the horizontal edges of said opening, said flange comprising a series of tabs separated by areas of reduced cross-section to facilitate bending; at least one series of parallel vertical grooves situated at the outer end of said plate to facilitate bending into a substantially perpendicular flange; and a pair of spaced apart mounting apertures to receive mounting screws for securing said plate to said door jamb.

4,183,569

ANTI-THEFT DOOR LOCK

Dennis C. Landfried, 135 Beachwood Ave., Avon Lake, Ohio 44012, and Raymond W. Busony, 1341 Thoreau, Lakewood, Ohio 44107

Filed Sep. 12, 1977, Ser. No. 832,443
Int. Cl.[2] E05C *13/02*
U.S. Cl. 292—347 **2 Claims**



1. In combination with an automobile door lock and an anti-thief locking device that actuates a conventional automobile door locking rod in a downward direction for locking and an upward direction for unlocking, comprising:

an elongated first member having a bore therein from one end to the other end, said first member structurally

adapted to be inserted into the automobile door lock opening located on a conventional door sill;

an elongated second member having a threaded bore at one end for threadingly engaging said automobile locking rod;

resilient spring means positioned about said second member, and retained thereon by spring retaining means; said spring further being in contact with the bottom portion of said first member, such that when said first and second members are actuated in a downward movement, the locking rod will become engaged and upon release of said second member, said first member will be moved in an upward direction by said spring means thereby shielding said second member said first member being held in position by said spring means against the bottom portion of said door sill.

4,183,570

RETRACTABLE TRASH SPEAR

Marshall W. Broyles, 201 Lincoln Dr., and Charles D. Schrader, 119 E. Monroe St., both of Alexandria, Ind. 46001

Filed Jul. 28, 1978, Ser. No. 929,164

Int. Cl.[2] B01B *1/00*

U.S. Cl. 294—61 **3 Claims**

1. A retractable trash spear device comprising: an elongated tubular handle member having opposite ends; an elongated rod element in said handle member and having a pointed end and an opposite end, said rod element being axially movable between an extended position with said pointed end projecting from one end of said handle member and a fully retracted position with said pointed end substantially completely within said handle member; said handle member having an elongated slot formed therein adjacent said other end; a manual actuating element attached to said rod element adjacent at a point spaced from said pointed end thereof and extending out of said slot for selectively moving said rod element between said retracted and said extended positions; spring means in said handle member for biasing said rod element toward said retracted position; means for selectively holding said rod element in said extended position; said slot extending to said other end of said handle member and having an end axially spaced therefrom, said holding means comprising a substantially right-angle extension of said slot at said end thereof, and further comprising a handle grip member on said other end of said handle member, said grip member having an end spaced from said slot end thereby exposing a section thereof, said actuating element extending through said exposed section of said slot; a ferrule element slidably mounted on said rod element adjacent said opposite end thereof and having a threaded opening therethrough communicating with said rod element, said actuating element having an inner end threadedly secured in said threaded opening and engaging said rod element thereby adjustably attached said actuating element to said rod element selectively to determine the extent of projection of said pointed end of said rod element in said extended position.

4,183,571

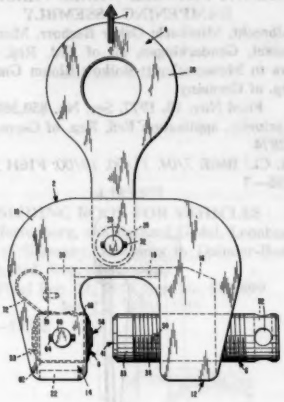
SCREW-TYPE LIFTING CLAMP

Charles J. Renfroe, Jacksonville, Fla., assignor to J. C. Renfroe and Sons, Inc., Jacksonville, Fla.

Continuation-in-part of Ser. No. 664,043, Mar. 4, 1976, abandoned. This application Feb. 3, 1977, Ser. No. 765,376

Int. Cl.[2] B66C *1/44*

U.S. Cl. 294—101 **16 Claims**



1. A screw-type clamp for lifting material such as metal plates, comprising:

a clamp body having generally an inverted U-shaped configuration when in normal vertical lifting orientation with spaced, opposed first and second projections defining a generally vertically downwardly facing material receiving slot therebetween open at its outer end;

a lifting shackle for lifting said clamp, attached to said clamp body adjacent the inner end of said slot and extending generally vertically upwardly from said body;

a screw having a shaft threadedly received through the first said body projection for rotation about a first horizontal axis, said screw having a first end fixed against vertical movement and defining a material gripping surface extending into said slot toward the second said body projection, said screw being threadedly movable horizontally toward and away from said second body projection;

a jaw mounted to said second body projection and having vertically spaced teeth defining a material gripping surface extending into said slot and opposing said material gripping surface of said screw so that threaded movement of said screw toward said jaw urges material in said slot into a gripping relationship between the material gripping surfaces of said jaw and said screw, said jaw being pivotable about a second horizontal axis perpendicular to and intersecting said screw axis to move said material gripping surface of said jaw upwardly and downwardly in said slot, said material gripping surface of said jaw being arcuately convex in a vertical plane, said jaw having a horizontal initial position at which said arcuate gripping surface extends furthest into said slot at a point along said first horizontal axis and recedes horizontally from said point uniformly above and below said first horizontal axis, said radius of curvature being greater than the horizontal distance between said jaw pivotal axis and said material gripping surface of said jaw when said jaw is horizontal, so that the jaw teeth bite into the material when said jaw

is pivoted downwardly by the weight of the material upon application of a lifting force to the shackle; and

resilient means connected between said clamp body and said pivotable jaw to resiliently urge said pivotable jaw in both rotational directions toward said horizontal initial position to cause said pivotable jaw to assume said horizontal initial position when not in contact with material to be lifted and to resist rotation of said pivotable jaw in either direction from said horizontal initial position.

4,183,572

RAILWAY FLANGED WHEEL VIBRATION DAMPENING ASSEMBLY

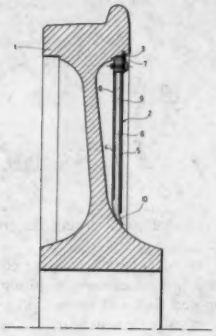
Helmut Albrecht, Miesbach; Oskar Bschorr, Munich, and Helmut Hassel, Genderkingen, all of Fed. Rep. of Germany, assignors to Messerschmitt-Bolkow-Blohm GmbH, Munich, Fed. Rep. of Germany

Filed Nov. 10, 1977, Ser. No. 850,368

Claims priority, application Fed. Rep. of Germany, Nov. 20, 1976, 2652874

Int. Cl.[2] B60B *7/04, 17/00, 19/00;* **F16H** *55/14*

U.S. Cl. 295—7 **10 Claims**



1. An apparatus for damping noise on a rail wheel, comprising damping disk means including a plurality of vibration absorbing plate elements, means securing said damping disk means to at least one side of said rail wheel in a force transmitting manner, and slot means dividing said damping disk means into said plurality of vibration absorbing plate elements.

4,183,573

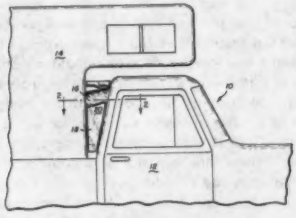
BOOT PROTECTION AND ANTITHEFT APPARATUS

Alvin H. DeRidder, 19146 Anne La., Cupertino, Calif. 95014

Filed Apr. 21, 1978, Ser. No. 898,764

Int. Cl.[2] B60P *3/32*

U.S. Cl. 296—166 **5 Claims**



1. A boot protection and antitheft apparatus for attachment to a standard truck cab between it and the camper to protect a flexible, hollow boot extending between an opening in a forward surface of the camper shell and the rear window frame of the truck cab, comprising:

a first side member including

a panel of substantially trapezoidal configuration so as to have generally the same shape as a vertical cross section of the space between the truck cab and camper shell except that the horizontal dimensions thereof are somewhat larger than said space, and

a rectangular flange formed along one of the edges of said panel at an acute angle to provide means for attachment of said side member to said truck cab with said panel deflected inwardly toward the boot;

a second side member which is substantially a mirror image of said first side member; and

means for connecting said side members to the truck cab at points along the sides of the rear window frame, the vertical edges of said panels opposite said one edge being disposed closer to each other than said flanges are disposed relative to each other whereby interference between said opposite edges and the front of the camper shell will prevent said panels from being deflected outwardly.

4,183,574

FORWARD LONGITUDINAL BEARER CONSTRUCTED AS CLOSED HOLLOW BEARER

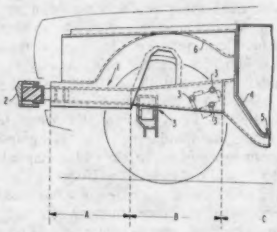
Wolfgang Klie, Korntal; Hermann Renner, Magstadt; Dieter Weidemann, Weil der Stadt, and Helmut Weisshappel, Sindelfingen, all of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany

Filed Apr. 22, 1977, Ser. No. 789,942

Claims priority, application Fed. Rep. of Germany, Apr. 30, 1976, 2619173

Int. Cl.[2] D62D *27/00*

U.S. Cl. 296—188 **14 Claims**



1. A forward longitudinal bearer of a motor vehicle constructed as a substantially closed, hollow bearer with an impact-near energy-absorbing part, characterized in that the forward longitudinal bearer is interposed between a bumper of the motor vehicle and a passenger space of the vehicle, the longitudinal bearer is divided into at least three individual sections and is assembled in such a manner so as to provide three series-connected zones with a first zone having a predetermined deformation area being arranged at a forward end of the longitudinal bearer in an area of the bumper, a second zone arranged in an area of the passenger space, and a center zone located within an area of support points for vehicle aggregates, and in that the center zone has a rigidity which exceeds a rigidity of the first and second zones.

4,183,575

EXTENSIBLE STAY FOR AUTOMOBILE CLOSURES

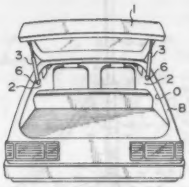
Toshio Hayashi, Hiroshima, Japan, assignor to Toyo Kogyo Co., Ltd., Hiroshima, Japan

Filed Apr. 25, 1978, Ser. No. 899,842

Claims priority, application Japan, Apr. 28, 1977, 52-54144[U]

Int. Cl.[2] B62D *33/00*

U.S. Cl. 296—56 **10 Claims**



1. Motor vehicle including a body formed with a rear end opening, a closure having a side edge at which said closure is pivotably mounted on said body so as to close the opening therein, at least one extensible stay having one end pivotably attached to the closure and the other end attached to the body, an L-shaped bracket provided between the stay and the body, said bracket having a first leg attached at an outer surface thereof to the stay and a second leg rotatably mounted on the body, a bracket cover for covering the L-shaped bracket, said bracket cover having a wall for engagement with said outer surface of the first leg on the L-shaped bracket and at least one projection for engagement with an inner surface of the first leg on the bracket so that the first leg is interposed between and gripped by the wall and the projection of the cover.

4,183,576

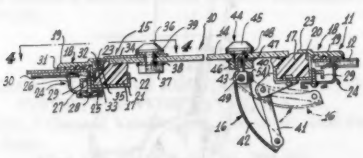
VEHICLE SUN ROOF HAVING ADJUSTABLE SEAL PRESSURE

Garold D. Frymire, Buena Park, Calif., assignor to Elixer Industries, Gardena, Calif.

Filed Aug. 29, 1977, Ser. No. 828,822

Int. Cl.[2] B60H *1/26*

U.S. Cl. 296—137 B **14 Claims**



1. A sun roof for installation in a vehicle roof comprising:

an outer frame member for engaging the outer surface of said vehicle roof and surrounding an opening therein, said outer frame member defining a channel;

an inner frame member of approximately the same size as said outer frame member positioned in opposition to said outer frame member to engage the inner surface of said vehicle roof;

means for securing said inner frame member to said outer frame member, thereby clamping said vehicle roof between said inner and outer frame members;

at least one panel shaped and dimensioned to cover said opening when in a closed position so that said channel faces said panel;

a compressible seal disposed in said channel between said outer frame member and said panel;

hinge means for pivotably connecting said panel to said frame and extending from said outer frame member over said panel;

a connection piece extending downwardly from said panel toward the interior of said vehicle;

latch means for securing said panel in a closed position and in at least one open position, said latch means including release means for releasably connecting said latch means between said connection piece and said outer frame member; and

anchor means mounted on said panel for adjustably positioning said connection piece to vary the downward compressive force exerted on said seal by said panel when said panel is in said closed position.

4,183,577

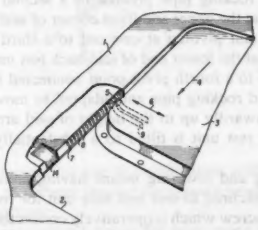
SLIDING ROOF FOR VEHICLES

Rolf Ohrle, Herrenberg, and Richard Godel, Leonberg, both of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany

Filed Feb. 27, 1978, Ser. No. 881,899

Int. Cl.[2] B60J *7/10*

U.S. Cl. 296—137 E **18 Claims**



1. Sliding roof for vehicles, especially passenger cars, comprising:

a sliding cover movable in longitudinal guides in the longitudinal direction of the vehicle;

means for stopping the sliding cover relative to the longitudinal guides;

at least one pressure member means provided on either side of the sliding cover for guiding and arbitrarily moving with the sliding cover crosswise to the direction of displacement, at least approximately in the horizontal direction with reference to the sliding cover;

on either side of the sliding cover in the longitudinal guides, an at least approximately vertical standing hard brake surface that runs in the direction of displacement;

said pressure member being provided with a rubber surface made as a rotatably borne brake roll with an axis of rotation parallel to the direction of displacement of the sliding cover;

at those places on the brake surface at which the braking rolls are located in the closed position of the sliding cover, upwardly slanted surfaces being provided in the brake surfaces, on which said upwardly slanted surfaces, in the spreading of the opposed brake rolls, said brake rolls roll upward and lift the sliding cover; and

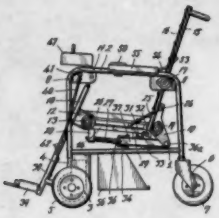
said brake surfaces being provided at regular intervals with vertically directed corrugations whose mutual distance of separation corresponds about to the width of the brake roll.

4,183,578

ELECTRICALLY OPERATED WHEELED CHAIR FOR PHYSICALLY HANDICAPPED PERSONS

Masahiro Naganawa, Kakami-nishi, Japan, assignor to Imasen Electric Co., Ltd., Japan

Filed Mar. 29, 1978, Ser. No. 891,201
Int. Cl.[2] A47C 1/02
U.S. Cl. 297—90 **4 Claims**



1. An electrically operated wheeled chair for physically handicapped persons comprising

a framework with casters,

at least one arm rest mounted on the upper side of said framework,

a back rest unit pivoted in an intermediate position between opposite ends thereof to a first pivot point provided at the upper and rear corner of said framework,

an inclined rocking pipe pivoted to a second pivot point provided at the upper and front corner of said framework,

a seat base unit pivoted at one end to a third pivot point provided at the lower end of said back rest unit and at the other end to a fourth pivot point connected to the lower end of said rocking pipe and adapted to move upwardly and downwardly up to the height of said arm rest when said back rest unit is tilted to a substantially horizontal position,

a seat lifting and lowering means having annular support members secured to said seat base unit for rotatably supporting a screw which is operatively connected to a motor secured to said seat base unit and a nut member being in threaded engagement with said screw, said nut having an extension operatively connected to a fifth pivot point provided at the lower end of said back rest unit by means of a connection plate.

4,183,579

DOCTOR'S STOOL

Enrique M. Gonzalez y. Rojas, Buenaventura #383-2, Ft. Chapultepec, Apartado Postal 954, Tijuana, Baja California, Mexico

Filed May 15, 1978, Ser. No. 905,799
Int. Cl.[2] B62J 1/00
U.S. Cl. 297—195 **4 Claims**

1. A stool, comprising:

a base having spaced floor engaging base legs;

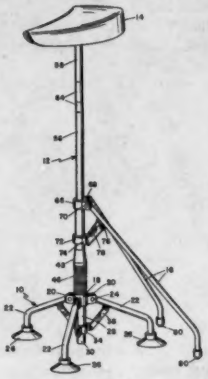
a post extending upwardly from said base and having a self-centering resilient hinge connection to the base;

a seat mounted on the upper end of said post;

a sleeve slidably mounted on said post above said hinge connection;

a pair of spaced stabilizer legs with upper ends pivotally attached to said sleeve and having floor engaging lower ends extending outwardly beyond the base legs;

a collar fixed on said post below said sleeve, with links pivotally connecting said stabilizer legs to the collar;



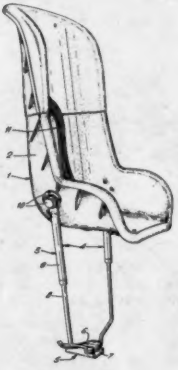
and a shoulder on said post defining a stop for limiting downward sliding motion of the sleeve and thereby limiting the outward spread of the stabilizer legs.

4,183,580

ARRANGEMENT FOR VEHICLE SEATS FOR CHILDREN

Karl-Eric Johansson, Tranas, Sweden

Filed Nov. 16, 1977, Ser. No. 851,879
Claims priority, application Sweden, Nov. 17, 1976, 7612816
Int. Cl.[2] A47C 1/08, 9/06
U.S. Cl. 297—250 **6 Claims**

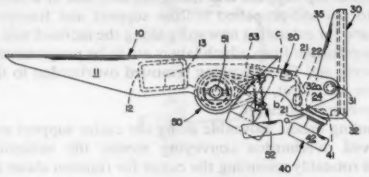


1. In a children's seating arrangement for use in vehicles, comprising a seat portion and holder means for holding said seat portion, the improvement wherein said holder means comprises a generally U-shaped bow of rigid material and an anchor element, said anchor element comprising means for securing it to the floor of a vehicle and a releasable locking device adapted to receive the closed lower end of said U-shaped bow releasably in a locked position in said anchor element, said holder means further comprising means for mounting said seat portion to and between the upper free ends of the spaced-apart arms of said U-shaped bow.

4,183,581
POSTURE IRON WITH SAFETY STOP

Alexander A. Karrip, Grand Rapids; Joseph M. Wisniewski, Wyoming, and Charles C. Pergler, Kentwood, all of Mich., assignors to Steelcase Inc., Grand Rapids, Mich.

Filed Mar. 6, 1978, Ser. No. 883,415
Int. Cl.[2] A47C 3/00
U.S. Cl. 297—306 9 Claims

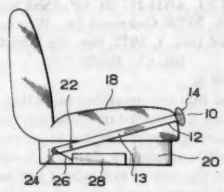


1. In a chair control having a seat support member and a back support member angularly adjustable relative to said seat support member, the improvement comprising: a support arm extending rearwardly from said seat support member and including a bottom wall with an aperture therein; said back support member being pivotally joined to said support arm and extending generally upwardly therefrom, said back support member including a bottom wall lying adjacent said bottom wall of said support arm at least adjacent said aperture in said support arm, and said bottom wall of said back upright member including an aperture adjacent said aperture of said support arm; releasable securing means passing through said apertures, with at least one of said apertures being larger in at least one dimension than that portion of said releasable securing means which passes through it and with at least said bottom wall of said back support member being radiused relative to the axis of its pivotal connection and in a fore and aft direction and lying against said bottom wall of said support arm in a convex manner whereby said back support member can be angularly adjusted relative to said support arm when said releasable securing means is loosened; a detent positioned on said support arm in the path of movement of said back support relative to said support arm, said detent being located so as to limit the extent to which said back support member can be tipped rearwardly relative to said support arm to thereby prevent said back support member from falling completely rearwardly in the event that said releasable securing means becomes disengaged from said apertures.

4,183,582
EMERGENCY PASSIVE RESTRAINT PROTECTIVE SYSTEM FOR VEHICLE OCCUPANTS

Kiyoji Taki, 9 Gotanda, Katahara-cho, Gamagoori, Aichi Prefecture, Japan

Filed Aug. 17, 1978, Ser. No. 934,603
Claims priority, application Japan, Oct. 11, 1977, 52-120995
Int. Cl.[2] A62B 35/00
U.S. Cl. 297—464 1 Claim



1. An emergency passive restraint device for vehicle occupants causing no disturbance for said occupant in entering, leaving, or driving said vehicle in normal state, being actuated to lift the occupant's knees upwardly so as to restrain said occupant against his forward and lateral movements simultaneously in emergency, comprising

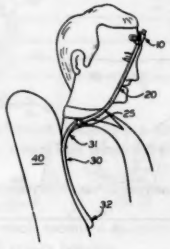
a horizontal rigid protective member covered with an elastic material, being supported along the front and side walls of the vehicle seat, having a pair of rigid legs extending toward the rear end of said seat, being pivoted to the frame of said seat at the near end of said leg, and being connected with a protector push-up means at the end of said leg beyond said pivot respectively, and

a pair of flexible cords being disposed along the side portion of the seat back, and being connected with a slider movable along said leg at one end of said cord, and at the other end connected with a cord pull-up means through a guide roll mounted on the shoulder of said seat back respectively.

4,183,583
HEAD-SUPPORT FOR USE IN A RECLINING SEAT

Lance E. Zuesse, 28 Bedford St., New York, N.Y. 10014

Filed Jul. 17, 1978, Ser. No. 924,992
Int. Cl.[2] A47C 1/10, 31/00
U.S. Cl. 297—393 2 Claims



1. A head-support for use in combination with a partially-reclining seat, to prevent the seat-occupant's head from falling forward, comprising:

a forehead-engagement means for positioning in such manner as to engage the forehead of the seat-occupant;

a connecting means extending from said forehead-engagement means;

a back-plate extending from said connecting means and engaging and sandwiched between the seat-occupant's back and the back-rest of the seat, said back-plate being pressed upon by both the back-rest and the seat-occupant's back, such that the head of the seat-occupant is restrained against falling forward, by the transmittal of forces from said forehead-engagement means through said connecting means to said back-plate.

4,183,584
DRESSING A ROCK FACE FOR ABANDONMENT

Albert L. St. Peter, 6820 E. Speedway Blvd., Tucson, Ariz. 85710

Filed Apr. 11, 1978, Ser. No. 895,498
Int. Cl.[2] E21C 47/00
U.S. Cl. 299—13 7 Claims

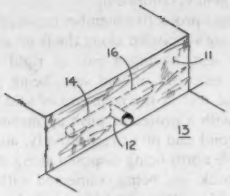
2. In an upright faced rock formation to be dressed to a gentle slope, said formation being over 120 feet in height, the process of dressing the face by blasting comprising:

cutting an adit at the foot of said formation, said adit having a predetermined length relative to the height of the rock formation;

at the inner end of said adit cutting at least one first pair of approximately horizontal cross tunnels normal to the adit;

charging at least one first pair of tunnels with explosives;

stemming the adit; and
stemming said tunnels;



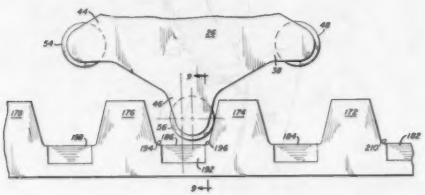
detonating the explosive charges whereby the resulting broken rock forms an evenly sloped surface of predetermined slope.

4,183,585

LONGWALL MINING MACHINE

John T. Brennan, Oil City, Pa., assignor to Joy Manufacturing Company, Pittsburgh, Pa.

Filed Mar. 21, 1977, Ser. No. 779,325
Int. Cl.² E21C *29/02*
U.S. Cl. 299—43 **7 Claims**



1. A longwall mining conveyor for use with a longwall mining machine comprising
an elongated pan,
a ramp plate oriented generally parallel to said pan disposed on one side of said pan,
rack means oriented generally parallel t said pan disposed on the opposite side of said pan from aid ramp plate,
said rack means having alternating upward projecting teeth and root portions, and
the upper surface of said root portions being sloped downwardly from one lateral side of said rack means to the other lateral side of said rack means
toward said conveyor pan, whereby mineral particles falling into said root portions will be directed toward said conveyor pan and will be carried away from such longwall mining machine.

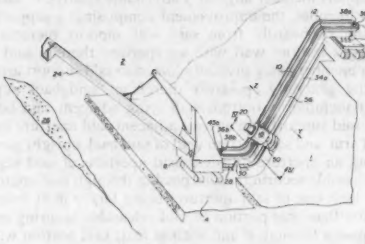
4,183,586

APPARATUS FOR PROGESSIVELY REMOVING LAYERS OF OVERBURDEN FROM AN INCLINED SIDE OF A CUT

Howard D. Owen, Glamorgan, Wales, and Terence Smith, Edmonton, Canada, assignors to The Research Council of Alberta, Edmonton, Canada

Filed Sep. 5, 1978, Ser. No. 939,809
Claims priority, application Canada, Jan. 27, 1978, 295800
Int. Cl.² E21C *35/20, 47/00*
U.S. Cl. 299—43 **2 Claims**

1. Apparatus for progressively removing layers of overburden from one inclined side of a cut to make adjacent strips of a mineral seam progressively accessible during strip mining, comprising:
(a) a self-propelled top support and transport unit for placement the top of the inclined side of the overburden from which layers are to be progressively removed and for movement along overburden adjacent to the inclined side,
(b) a self-propelled bottom support and transport unit for placement at the bottom of the inclined side of the overburden from which layers are to be progressively removed and for movement along and adjacent to the bottom of that inclined side,
(c) a cutter support and removed overburden conveying means, for attachment at an upper end to the self-propelled top support and transport unit and at a lower end to the self-propelled bottom support and transport unit, and for extending upwardly along the inclined side of the overburden from which layers are to be progressively removed, and for conveying removed overburden to the bottom of the cut,
(d) an overburden cutter,
(e) mounting means moveable along the cutter support and removed overburden conveying means, the mounting means rotatably mounting the cutter for rotation about an axis which is substantially at right angles to the plane, of



the inclined side of the cut, from which overburden is to be removed,
(f) driving means for driving the cutter to cut overburden and convey the cut overburden to the cutter support and overburden conveying means,
(g) moving means for moving the mounting means in either direction along the cutter support and overburden conveying means, and
(h) a distribution conveyor, with an adjustable discharge end, attached to the bottom support and transport unit for conveying removed overburden therefrom and depositing the removed overburden, in substantially the same geological sequence to that in which it was mined, on the opposite inclined side of the cut to that from which it was removed, and wherein the improvement comprises:
(i) the cutter support and overburden conveying means comprises an I-shaped beam, and the mounting means moveabie along the cutter support and removed overburden conveying means rotatably mounts the cutter for the cut overburden to be deposited on a lower flange of the I-shaped beam.

4,183,587

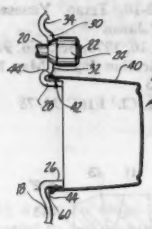
WHEEL AND HUBCAP ASSEMBLY

Edward G. Spisak, 35700 Oakwood Ln., Westland, Mich. 48185

Filed Dec. 1, 1977, Ser. No. 856,419
Int. Cl.² B60B *7/06*
U.S. Cl. 301—108 R **4 Claims**

1. A wheel and hub cap assembly including a wheel having an outer face with a plurality of uniformly and circumferentially spaced mounting bosses adapted to receive and to engage wheel securing nuts, an annular flange extending axially from said face adjacent the axis of said wheel and radially inwardly of said mounting bosses, a cup-shaped cap having a radially extending lip at the opening of said cup, said lip forming a radially inwardly opening annular groove, a retaining member having a radially outwardly extending flange disposed in said groove, said retaining member having a plurality of uniformly

spaced resilient attaching portions extending radially inwardly from said lip and axially outwardly from said face, each of said attaching portions having an edge to bitingly engage the radially outward exterior of said annular flange to resist axial displacement of said cap from said wheel, and said mounting



bosses being raised axially from said face, said lip engaging said bosses when said attaching portions are in engagement with said axial flange to maintain said lip in predetermined spaced relationship to the face of said wheel at locations between said mounting bosses.

4,183,588

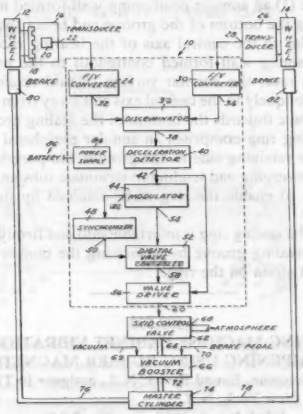
SKID CONTROL SYSTEM AND METHOD FOR AUTOMOTIVE VEHICLES

Robert C. Snyder, Country Club Hills, Ill., assignor to Motor Wheel Corporation, Lansing, Mich.

Continuation of Ser. No. 801,774, May 31, 1977, abandoned. This application Apr. 26, 1978, Ser. No. 900,274

Int. Cl.[2] B60T *8/02*

U.S. Cl. 303—110 **17 Claims**



1. In a wheeled vehicle having a vacuum-boosted hydraulic brake system, the method of controlling braking of said vehicle in accordance with performance of a selected braked wheel comprising the steps of (a) monitoring performance of said wheel to provide a control signal when performance of said wheel indicates an impending wheel lock-up condition, (b) substantially relieving brake pressure at said monitored wheel in response to said control signal, and (c) gradually reapplying brake pressure at said monitored wheel as a preselected function of time over a predetermined control cycle time independently of said wheel performance in the absence of said control signal.

4. In the combination comprising a brake control circuit and a wheeled vehicle brake system characterized by a slow system response time as compared to the time required to generate a control signal in said circuit, the improvement in said control circuit comprising means monitoring performance of at least one wheel of said vehicle during braking to develop a control signal when performance of said wheel indicates an impending lock-up of said wheel, means substantially relieving brake pressure at said at least one wheel in response to said control signal and means gradually reapplying brake pressure at said wheel as a predetermined function of time over a predetermined control cycle time independently of said wheel performance in the absence of said control signal.

4,183,589

IMPROVEMENTS IN OR RELATING TO LOCKING DEVICES FOR ROTARY BEARINGS

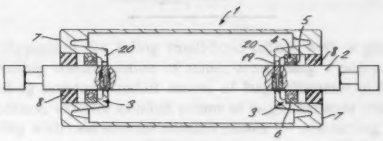
Kenneth Heenan, Sheffield, England, assignor to National Research Development Corporation, London, England

Filed May 19, 1978, Ser. No. 907,721

Claims priority, application United Kingdom, Jul. 1, 1977, 27636/77

Int. Cl.[2] F16C *13/00*

U.S. Cl. 308—1 A **9 Claims**



9. Rotary mechanism including a device to automatically prevent rotation when said mechanism overheats, and comprising:

two mutually rotatable parts, supporting a rotary bearing between them;

a retractable catch member mounted on one of said parts close to said rotary bearing;

an abutment member mounted on the other of said parts, and

a fusible plug contained within said retractable catch member, said fusible plug being so located that overheating of said bearing causes said plug to melt and said members to engage and prevent further rotation of said mutually rotatable parts.

4,183,590

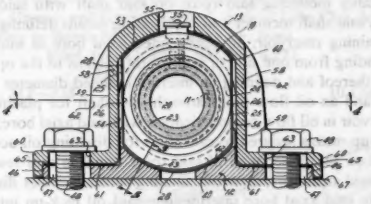
SELF-ALIGNING BEARING

Donald P. Lower, Mishawaka, Ind., assignor to Eagle-Picher Industries, Inc., Cincinnati, Ohio

Filed Mar. 23, 1978, Ser. No. 889,202

Int. Cl.[2] F16C *23/00*

U.S. Cl. 308—72 **15 Claims**



2. In self-aligning shaft bearing structure of the type including a generally spherical ball having a diametral bore, a base and a cap presenting opposed seats, the ball being receivable between the base and the cap in said seats for aligning with a shaft to be received in said bore,

the improvement comprising,

a pair of generally parallel flats formed on opposite sides of said ball,

a pair of cylindrical lands on the ball extending transversely to said bore and running between the said flats,

said ball having a bead running circumferentially around it, said bead being centered on said flats and lands,

the lands and flats providing clearance spacing so that the bead does not engage the seats of said cap and base when said ball is seated therein,

said cap having opposite inwardly facing flat sides adjacent the seat thereof,

the spacing between the sides of said cap slightly exceeding that of the flats of the ball to permit a limited range of alignability of the ball in the cap, between positions at which a flat of the ball comes to bear against a flat side of the cap.

4,183,591

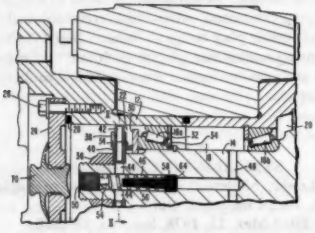
RECIRCULATING BEARING OIL FILTER ASSEMBLY

Donald K. Mayer, Bloomington, Minn., assignor to Thermo King Corporation, Minneapolis, Minn.

Filed Jun. 29, 1978, Ser. No. 920,899

Int. Cl.[2] F16C *33/66*

U.S. Cl. 308—187 **4 Claims**



1. A rotor member having an axial cavity defining an inner cylindrical wall; a shaft member; bearing means for coaxially rotatably mounting said rotor on said shaft with said inner wall, said shaft member and said bearing means defining an oil containing reservoir; an open ended axial bore in said shaft extending from one side of said bearing means to the opposite side thereof and defining an internal reduced diameter shoulder, and an oil flow path through said shaft for placing said reservoir in oil flow communication with said axial bore; an oil pick-up means secured to said shaft for directing oil accumulated on said inner wall of said rotor opposite said reservoir into said axial bore; a porous filtering media member disposed within said axial bore intermediate said oil pick-up into said bore and said flow path therefrom to said reservoir and defining a base portion for abutting said internal shoulder; an end plug for closing said open end of said bore; and, spring means extending between said end plug and said filtering media member and resilient urging said base portion of said filtering media member into substantially sealing engagement with said shoulder when said plug is inserted within said bore.

4,183,592

SEALED ROLLING BEARING

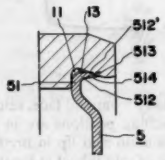
Kyosuke Sudo, No. 306 Kyodo Bldg., 7 Ban, Kameino, Fujisawa-shi, Kanagawa-ken; Hisao Hasunuma, No. 25, 3 Ban, 2 chome, Kawana, Fujisawa-shi, Kanagawa-ken; Takahiro Yamaoka, 3-81, Nishi-Uraga-machi, Yokosuka-shi, Kanagawa-ken, and Shigeru Sagae, 1250-10, Terao, Yanasa-machi, Koza-gun, Kanagawa-ken, all of Japan

Filed May 16, 1978, Ser. No. 906,160

Claims priority, application Japan, May 13, 1977, 52-54214; Mar. 24, 1978, 53-32883

Int. Cl.[2] F16C *33/78*

U.S. Cl. 308—187.2 **11 Claims**



1. An improved sealed rolling bearing of the type having at least a pair of bearing races comprising an outer race and an inner race, a bore being defined between the races, a rolling member disposed between the outer race and the inner race, a cage between the races, and an annular sealing ring provided at least at one end of the bore between said outer race and said inner race, wherein the improvement comprises: (a) one of the races having an annular sealing groove having a widened bottom portion formed therein and disposed in one end of the bore between the races, the cross section of the sealing groove comprising: (1) an annular positioning wall formed in the race and defining the bottom of the groove and being substantially perpendicular to the central axis of the bearing races; (2) an annular retaining wall formed contiguous to the positioning wall in the race, the annular surface of said retaining wall extending obliquely to the central axis and away from the outer end of the race towards the bottom of the sealing groove; and (b) the sealing ring comprises an annular peripheral wall disposed at the retaining side of the groove, the peripheral wall having a converging end tending to terminate substantially at a single point to enable the ring to be retained by the sealing groove, and

wherein the sealing ring is insertable into and firmly retained by the sealing groove by deforming the converging end without strain on the ring.

4,183,593

SEWING MACHINE CABINET VIBRATION DAMPENING USING RUBBER MAGNETS

Wesley R. Peterson, Bound Brook, N.J., assignor to The Singer Company, New York, N.Y.

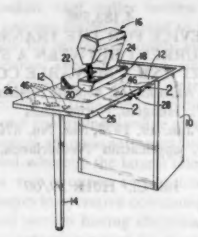
Filed Jan. 8, 1979, Ser. No. 2,046

Int. Cl.[2] A47B *81/00*; F16B *47/00*

U.S. Cl. 312—21 **2 Claims**

1. In a sewing machine cabinet having a base, a sewing machine support surface fastened to the base for supporting a sewing machine thereon, said sewing machine having a bed supporting a work surface, a convertible work surface moveable from a lowered position wherein said convertible work surface forms an extension of said sewing machine support surface to a raised position wherein said convertible work surface forms an extension of the work surface of the sewing machine bed, and at least one articulated ferrous support hinge for supporting said convertible work surface in said lowered position and in said raised position, a vibration dampening member for dampening vibration associated with said at least one articulated support hinge for reducing the transmission of vibration between said support surface and said convertible

work surface, said vibration dampening member comprising a material having a resilient surface which exhibits magnetic



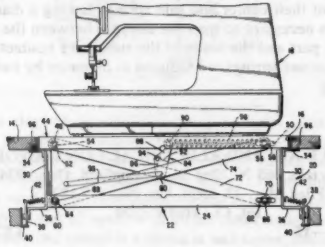
properties, whereby a ferrous hinge placed in the vicinity thereof will be attracted to said vibration dampening member and precluded from vibrating by said resilient surface.

4,183,594

TWO LEVEL SEWING SYSTEM

Robert L. Mey, Jonesboro, Ark.; Roy M. Cowdrey, Greenfield, Mass., and John A. Lenhart, Bronxville, N.Y., assignors to The Singer Company, New York, N.Y.

Filed Jun. 22, 1978, Ser. No. 918,119
Int. Cl.[2] A47B *51/00*; D05B *75/00*
U.S. Cl. 312—27 **5 Claims**



1. A mechanism mountable within a sewing machine cabinet for selectively moving a sewing machine between a storage position and a first position in which the work supporting surface of the sewing machine is coplanar with the top of the cabinet and a second position in which the bed of the sewing machine is elevated above the top of the cabinet, said mechanism comprising:

a frame pivotally mounted within said cabinet for movement between said storage position and an operative position;

means for selectively securing said frame in said operative position;

a sewing machine mounting cradle;

coupling means interconnecting said cradle and said frame, and arranged to allow only translatory motion of said cradle, always parallel with respect to said frame;

lifting means including a toggle linkage means acting upon said coupling means for both raising and lowering said cradle between said first and said second positions; and

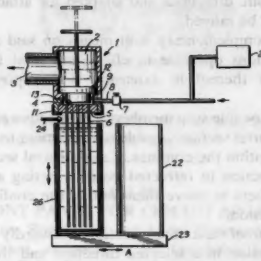
means for lockably retaining said cradle in said second position.

4,183,595

APPARATUS FOR FILLING GLASS TUBING WITH PURE GAS

William Hegarty, New Rochelle, N.Y., assignor to Self-Powered Lighting, Ltd., New York, N.Y.

Filed Jul. 21, 1978, Ser. No. 927,252
Int. Cl.[2] H01J *9/385, 9/395*
U.S. Cl. 316—30 **7 Claims**



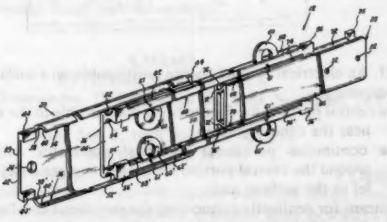
1. Apparatus for filling small-bore tubing with a gas and preventing contamination of same, comprising a pump-head including interior conduit means of large diameter and low impedance, exterior conduit means of large diameter communicating with said interior conduit means for connecting same to an exterior high-speed, high-vacuum pump, small-diameter conduit means communicating with said interior conduit means for connecting same with a source of said gas, said small-diameter conduit means having valve means therein, port means at one end of said interior conduit means for communicating with a mounting means for holding said small-bore tubing, clamp means for holding said mounting means in sealed relationship to said port means and plug means movable between first and second positions, said plug means in said first position providing for rapid evacuation of said interior conduit means, said small-diameter conduit means and said small-bore tubing when attached to said pump-head, said plug means in said second position sealing off said exterior conduit means and all but a minor portion of said interior conduit means from communication with said small-diameter conduit means and said small-bore tubing and providing for transfer of said gas from said source and said small-diameter conduit means through said minor portion of said interior conduit means to said small-bore tubing, the small size of said minor portion minimizing the quantity of said gas remaining in said pump-head after filling said tubing with gas.

4,183,596

TWO WAY TRAVEL DRAWER SLIDE

Roger F. Greene, and Gordon F. Clark, both of Lake City, Iowa, assignors to Bowie Mfg. Co., Lake City, Iowa

Filed Jan. 17, 1979, Ser. No. 4,273
Int. Cl.[2] A47B *88/00*
U.S. Cl. 312—333 **10 Claims**



1. A two way travel three section drawer slide assembly for

permitting a drawer to be selectively pulled out from opposite sides of a support body, comprising in combination:

an outer elongated channel section fixedly attached to the support body,

a central elongated channel slide section telescopically slidably journalled in said outer section for movement in two respective opposite directions,

an inner elongated slide section telescopically slidably journalled in said central section for movement in two respective opposite directions and adapted for attachment to a drawer to be moved,

respective complementary stop means on said central and inner sections operable to effect and limit the relative movement thereof in extension within predetermined limits,

respective movable stop members at respective end portions of said central section capable of movement to and from a position within the confines of said central section,

said inner section in retracted position acting against said stop members to move them out of the confines of said central section,

the extension of said inner section outwardly from said central section in a selected direction and the resulting movement of the trailing end thereof relative to the direction of movement effecting the disengagement of said trailing end with the corresponding stop members on said central section,

the continued movement of said inner section in said selected direction acting to engage said stop means to effect corresponding movement of said central section,

means on said outer section operable during the extension of said central section to move said stop members into the confines of said central section and hold them immovable therein,

said inner section when moved in the opposite direction towards retracted position acting against said immovable stop members to effect the retraction of said central section, and

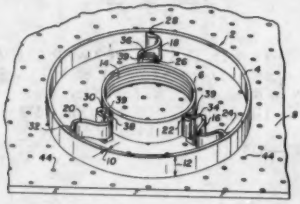
full retraction of said inner section acting in cooperation with said outer section to restore mobility to said stop members and to move them out of the confines of said central section.

4,183,597

ELECTRICAL CONTACT SYSTEM

Maurice G. N. G. Lebecque, 9125 Wiltshire Pl., Burnaby, B.C., Canada (V3L 4N6)

Filed Jul. 5, 1978, Ser. No. 922,032
Int. Cl.² H01R *39/00*
U.S. Cl. 339—1 L **21 Claims**



1. An electrical contact fixture positionable on a surface and comprising:

a central portion, the fixture being connectable to the surface near the central portion;

a continuous peripheral electrical conductor extending around the central portion for positioning generally parallel to the surface; and

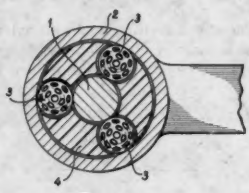
means for resiliently connecting the peripheral conductor to the surface for movement of the peripheral conductor generally parallel to the surface when the fixture is connected to the surface.

4,183,598

CONTACT DEVICE FOR THE TRANSMISSION OF ELECTRIC CURRENT BETWEEN A STATIONARY CONTACT PART AND A MOVABLE CONTACT PART

Martinus A. Oude Aarninkhof, Almelo, Netherlands, assignor to Hazemeijer B.V., Hengelo, Netherlands

Filed Jan. 19, 1978, Ser. No. 870,734
Claims priority, application Netherlands, Jan. 21, 1977, 7700648
Int. Cl.² H01R *39/00*
U.S. Cl. 339—6 R **10 Claims**



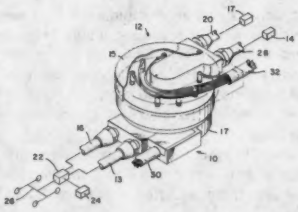
1. Contact device for the transmission of electric current between a stationary contact part and an oblong movable contact part, in which the stationary contact part has walls at least partially encircling the movable contact part, comprising resilient elements for the transmission of current situated between the movable contact part and the walls of the stationary contact part, said resilient elements are roller contact springs made of a material with sufficient electric conductivity, elasticity and mechanical strength, said roller contact springs being wedged in between the movable contact part such that upon movement of the movable contact part said contact springs revolve about their center and said springs having a diameter larger than is necessary to span the distance between the movable contact part and the walls of the stationary contact part, said roller contact springs are reduced in diameter by twisting or torsioning.

4,183,599

VEHICLE AIR AND ELECTRICAL CONNECTOR

Lloyd M. Wetzig, 465 N. 22nd St., Springfield, Oreg. 97477

Filed Mar. 23, 1978, Ser. No. 889,187
Int. Cl.² H01R *3/04*
U.S. Cl. 339—15 **4 Claims**



1. A composite air and electrical coupling for a vehicle having a plurality of electrical inputs, an air supply and a control air conduit and a trailer having a plurality of electrical outlets, an air reservoir, a control air conduit and air actuated brakes, comprising:

a hollow case formed in two laterally telescoping vehicle and trailer sections, means releasably locking the two sections together, said vehicle cupped section having first

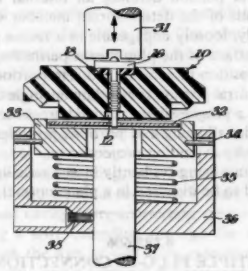
energizing air passage means adapted to be connected to the air supply on the vehicle and separate first control air passage means adapted to be connected to the vehicle control air conduit, said trailer section having second energizing air passage means adapted to be connected to said air reservoir for providing supply air to actuate said brakes and separate second control air passage means adapted to be connected to an air control valve on the trailer for directing air from the reservoir to the brakes,

said first and second energizing passage means and said first and second control air passage means being respectively coaxially aligned whereby the lateral telescopic interconnection of the two sections automatically couples the respective passages in operative communication with each other, each said section having electrical terminals, and electrical interconnection means for electrically interconnecting the terminals when the two sections are telescopically interconnected.

4,183,600
ELECTROLYTIC CAPACITOR COVER-TERMINAL ASSEMBLY

Walter W. Schroeder, Williamstown, Mass., assignor to Sprague Electric Company, North Adams, Mass.

Filed Oct. 10, 1978, Ser. No. 950,186
Int. Cl.[2] H01G *9/10*
U.S. Cl. 339—218 R **7 Claims**



4. An electrolytic capacitor cover-terminal assembly comprising a molded polyphenylene sulfide cover containing at least one gasketed terminal, said terminal having an enlarged end portion and a serrated shank which extends through and beyond said cover, said gasket being adjacent said enlarged end portion and of equal to or larger outer diameter than said end portion and seated in a recess in said cover, and said terminal being thermally and compressively bonded to said cover.

4,183,601
TERMINAL POST

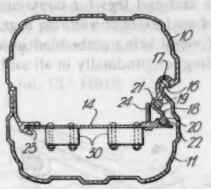
Robert J. Barber, Carleton Place, and Francis R. Campbell, Ottawa, both of Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed Oct. 2, 1978, Ser. No. 947,592
Int. Cl.[2] H01R *13/44*
U.S. Cl. 339—44 R **8 Claims**

1. A terminal post housing for wire connector blocks and the like comprising:

a hollow housing having a removeable front part and a back part, one of said front and back parts having a vertical arcuate channel in its outer surface proximate and parallel to its edge adapted to receive and engage, by rotation relative to the other of said front and back parts into closed positions, a bead of compatible shape and cross-section along at least a portion of an opposite edge of said other part; and

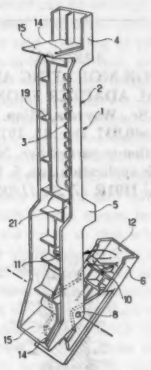
inside said terminal post housing a vertical panel or frame for supporting said wire connector blocks and the like, hinged at one vertical edge thereof to said back part of the housing such as to permit substantial frontal access to its back side when said front part is removed.



4,183,602
FRONT PANEL FOR CIRCUIT BOARDS

Gérard Meunier, Strasbourg, and André Tisserand, Fegersheim, both of France, assignors to La Telephonie Industrielle et Commerciale-Telic, Strasbourg, France

Filed Jun. 28, 1978, Ser. No. 919,657
Claims priority, application France, Jul. 21, 1977, 77 22359
Int. Cl.[2] H01R *13/62*
U.S. Cl. 339—45 M **7 Claims**



1. A front panel for circuit boards which plug into connectors attached to a bin, said boards sliding transversely within guides carried by said bin, said boards further bearing notches on opposite sides and adjacent one end thereof, said front panel comprising a bar of insulated material defining a stiffener for the board, said stiffener comprising lugs at opposite ends, said lugs incorporating slots engaging corresponding ones of said notches and which notches form hooks for said lugs, said stiffener carrying a central boss intermediate of said lugs, an extractor lever articulated to the stiffener bar, beneath the central boss for pivoting into coplanar position with said stiffener, and with its outer surface flush with the face of said boss and to thereby blend with the stiffener.

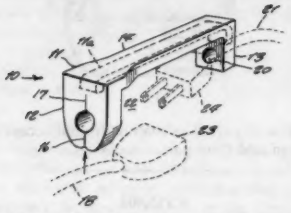
4,183,603
EXTENSION CORD LOCK

Robert Donarummo, 15 Ridgewood St., East Northport, N.Y. 11731

Filed Jun. 9, 1978, Ser. No. 914,078
Int. Cl.[2] H01R *13/54*
U.S. Cl. 339—75 P **1 Claim**

1. A lock for a pair of interconnected extension cords, comprising in combination, a generally U-shaped body molded of a resilient material, and including a pair of parallel, opposite end

legs and an intermediate leg therebetween, each said end leg having an opening therethrough for receiving an extension cord, said openings being axially aligned with each other, and a space between said end legs for containing interconnected plugs on ends of said extension cords; a generally U-shaped stiffening bar of metal being embedded inside said U-shaped body and extending longitudinally in all said legs; at least one



said leg including a slit extending from an outer end thereof and through said opening so to form a pair of jaws for flexing apart so to insert said extention cord in said opening; and a detent along a portion of said slit between said hole and said leg outer end, said detent protruding from one said jaw and into a correspondingly shaped depression in the other said jaw so as to bridge across said slit when said jaws are closed.

4,183,604

APPARATUS FOR MOUNTING AND REMOVING ELECTRICAL ADAPTER FROM A SOCKET

David A. Tjornhom, Sr., Wayzata, Minn.

Division of Ser. No. 640,937, Dec. 15, 1975, Pat. No. 4,093,333, which is a continuation-in-part of Ser. No. 500,610, Aug. 26, 1974, abandoned. This application Jun. 5, 1978, Ser. No. 912,537

Int. Cl.[2] **H01R** *17/20, 31/06, 43/00*

U.S. Cl. 339—78 **20 Claims**

1. An apparatus for mounting and removing an adapter from a socket, said adapter having releasable locking structure for holding the adapter in the socket, said locking structure including a band spring with an end portion and a finger connected to the spring, comprising: a casing, tool means mounted on the casing and engageable with the locking structure to release the locking structure whereby the adapter can be removed from the socket, said tool means having a lip engageable with the end portion to move the spring and finger to a non-locking position, said casing having a flange that surrounds a portion of the adapter, said flange having a slot for accommodating a part of the adapter and aligning the lip with the end portion whereby movement of the lip will release the locking structure.

4,183,605

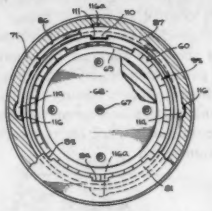
ELECTRICAL CONNECTOR WITH ARCUATE DETENT MEANS

Hal Arneson, Lawton, N. Dak., assignor to Automation Industries, Inc., Los Angeles, Calif.

Division of Ser. No. 708,475, Jul. 26, 1976, Pat. No. 4,066,315. This application Nov. 2, 1977, Ser. No. 847,848

Int. Cl.[2] **H01R** *13/54*

U.S. Cl. 339—89 M **2 Claims**



1. An arcuate detent spring member for an electrical connector having a receptacle means and a plug means movable relative to each other along an axis into and out of mated and unmated position, comprising:

a resilient yieldable body member of arcuate form having a thick central portion defining an internal key midway between ends of the detent spring member which is axially, slidably, loosely engageable in a recess provided on the inner surface of the plug means permitting movement from one position to another and arm portions extending from the central portion subtending an angle of up to 270° and having a progressively reduced cross-sectional area,

said arm portions having end portions provided with radially outwardly extending projections,

said arm portions being resiliently biased radially outwardly and adapted to be disposed in a plane normal to said axis.

4,183,606

MULTIPLE PLUG-IN CONNECTION

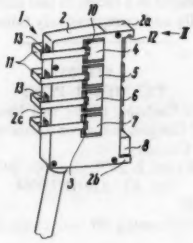
Walter Kies, Ditzingen, Fed. Rep. of Germany, assignor to ECKARDT AG, Fed. Rep. of Germany

Filed May 3, 1977, Ser. No. 793,247

Claims priority, application Fed. Rep. of Germany, May 18, 1976, 2621979

Int. Cl.[2] **H01R** *13/54*

U.S. Cl. 339—91 R **23 Claims**



1. A multiple connector device for codable socket connectors with a plurality of plug pins, said device comprising a plurality of socket members each including a plurality of socket connections, and a common frame means for holding each of said plurality of socket members in relatively displaceable parallel positions with respect to one another, each of said plurality of socket members being individually movable within said frame means parallel to one another and an additional

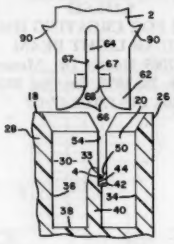
socket member in said frame means which is fixed at a predetermined position.

4,183,607

CONNECTING MEANS FOR FINE WIRES

Donald W. K. Hughes, Mechanicsburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Jul. 17, 1978, Ser. No. 925,503
Int. Cl.[2] H01R *9/08*
U.S. Cl. 339—97 R **10 Claims**



1. Electrical connecting means for establishing electrical contact with a wire having a thin film insulating material thereon and comprising an insulating housing having a terminal-receiving surface and a terminal-receiving cavity extending into said terminal-receiving surface, said cavity having an inner end which extends parallel to said terminal-receiving surface and said cavity having internal walls which extend from said inner end towards said terminal-receiving surface, wire-admitting slot means in said housing, said wire-admitting slot means extending from said terminal-receiving surface and communicating with said cavity, wire-supporting means in said cavity for supporting a wire extending through the wire-admitting slot means with the axis of said wire extending transversely across said cavity, and a terminal dimensioned to be inserted into said cavity, said terminal having insulating penetrating and contact surface portions which are engageable with said wire upon insertion of said terminal into said cavity, said connecting means being characterized in that:

said wire-supporting means comprises a wire-supporting ledge on one of said internal walls of said cavity, said ledge extending transversely across said one internal wall and being in alignment with said wire-admitting slot means, said ledge extending parallel to the axis of a wire positioned said wire-admitting slot means, said one internal wall having one surface portion which extends from said ledge towards said terminal-receiving surface and a second surface portion which extends from said ledge away from said terminal-receiving surface and to said inner end of said cavity,

said terminal being dimensioned to have a force fit of said insulating penetrating and contact surface portions against a wire supported on said ledge when said terminal is inserted into said cavity,

said ledge having a width which is substantially no greater than the diameter of said wire and which is sufficient to prevent movement of said wire laterally of its axis past said ledge and across said second surface portion of said one internal wall during insertion of said terminal into said cavity whereby,

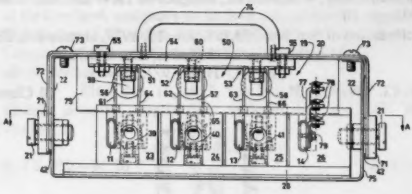
upon placement of said wire in said wire-admitting slot means and insertion of said terminal into said cavity, said insulation penetrating and contact surface portions of said terminal move over said wire and establish electrical contact therewith.

4,183,608

ELECTRICAL DISTRIBUTION SYSTEMS

Wilfrid Nicholls, Liverpool, England, assignor to Maxam Switchgear Limited, Liverpool, England

Filed Jan. 18, 1978, Ser. No. 870,576
Claims priority, application United Kingdom, Jan. 19, 1977, 2044/77
Int. Cl.[2] H01R *13/68*
U.S. Cl. 339—147 R **13 Claims**



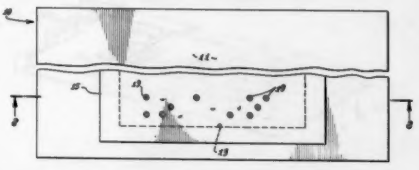
1. A fused switch tap-off assembly for a busbar system comprising in combination a length of trunking having opposed side walls and a front wall with an access opening therein; a cover for closing said access opening; side arms on said cover; pivot means pivoting said side arms respectively to said trunking side walls at points longitudinally spaced from said access opening whereby the cover can be pivoted about a transverse hinge axis between closed and open positions; busbars supported longitudinally in said trunking in spaced parallel relationship; and a fused switch tap-off unit, said unit comprising insulator means disposed within said trunking and about and between said busbars, output terminals in said insulator means between said busbars, a first set of switch contacts contained in said insulator means and electrically associated with respective ones of said busbars, a second set of switch contacts contained in said insulator means between said busbars and electrically associated with respective ones of said output terminals, first and second sets of switch blades, means insulatedly attaching said switch blades to said cover so that when said cover is in said closed position the blades of said first set of switch blades are in electrical contact with respective ones of said busbars and said first switch contacts and the blades of the second set of switch blades are in electrical contact with the respective output terminals and said second switch contacts and so that the switch blades are all isolated from the switch contacts when the cover is in its open position, and fuses received on said cover to interconnect respective ones of the switch blades of the first and second sets of switch blades.

4,183,609

INSULATOR BOARD FOR SPRING PROBE FIXTURES

L. Jack Luna, 1868 N. Calle Salto, Thousand Oaks, Calif. 91360

Filed Mar. 16, 1978, Ser. No. 887,038
Int. Cl.[2] G01R *15/12*
U.S. Cl. 339 R—176 **12 Claims**



1. In an insulator board for spring probe assemblies,

(a) upper and lower horizontal plates which are vertically spaced apart,

(b) vertically extending tubular housings to receive spring probe assemblies, the housings extending through bores

formed in the plates and the housings operatively connected to the plates, and

(c) insulative material associated with at least one of the plates and bonded to portions of the housings adjacent at least one plate, said material extending in at least one layer bonded to a side of at least one plate.

4,183,610

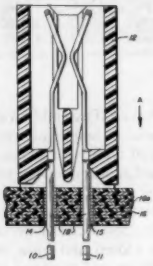
ELECTRICAL CONNECTION APPARATUS

Edward H. Key, Wheaton, Ill., assignor to TRW Inc., Elk Grove Village, Ill.

Continuation of Ser. No. 759,128, Jan. 13, 1977, abandoned. This application Sep. 1, 1978, Ser. No. 938,760

Int. Cl.[2] H01R *9/12*

U.S. Cl. 339—221 R **24 Claims**



1. In electrical connection apparatus including a mounting board having a plurality of spaced holes of a wide range of sizes therein and a plurality of contact pins adapted to be partially contained in said board holes, the improvement comprising each of said contact pins having a press-fit section comprising, in cross-section, a curved or arcuate, generally "C"-shaped segment having smooth, continuous inner and outer curved surfaces and which remains open in that the end portions of such "C"-shaped segment do not abut one another and have a freedom of movement both before and after said press-fit section is inserted into said holes, said press-fit section being dimensioned and formed of a material whereby said press-fit section undergoes plastic deformation in a substantial portion thereof upon insertion into any one of said wide range of holes.

4,183,611

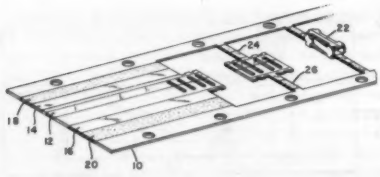
INLAID CONTACT

Albert Casciotti, Hershey, and Gary L. Zimmerman, Shermansdale, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed May 13, 1976, Ser. No. 685,856

Int. Cl.[2] H01R *9/06*

U.S. Cl. 339—275 B **7 Claims**



1. An improved electrical contact terminal which is stamped and formed from a strip of thin metal stock inlaid with at least one strip of metal of special electrical and/or mechanical characteristics, said contact terminal having a primary contact area and at least one mounting tab, comprising:

a base strip of a first metal material;

at least first and second parallel channels skived in said base strip;

a strip of second metal, selected from the group of noble materials, inlaid into each said at least one first channel;

a strip of third metal, selected from the group of solder resistant materials, inlaid into each said second channel;

said contact being stamped and formed from said base strip and inlaid strips with said second metal material lying at said area of primary contact and said third material lying between said mounting tabs and said second metal material whereby wicking of solder onto said noble metal is prevented.

4,183,612

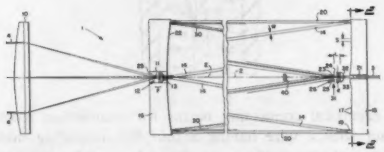
OPTICAL SYSTEM FOR CREATING HIGH-INTENSITY SOLAR LIGHT BEAM

Kenneth F. Taucher, 7069 Hoover Dr., Mentor, Ohio 44060

Filed Feb. 24, 1978, Ser. No. 880,764

Int. Cl.[2] G02B *17/00*

U.S. Cl. 350—27 **19 Claims**



1. An optical concentrator, comprising:

input means for delivering a plurality of relatively diverging collimated light bundles;

converging means for converging said plurality of diverging collimated light bundles and each of the same to an area of concentration; and

output means for substantially collimating light from said area of concentration to form a relatively concentrated, substantially collimated output beam.

4,183,613

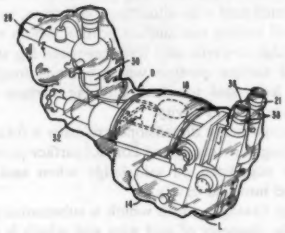
MICROSCOPE DRAPE AND METHOD OF MAKING SAME

David L. Walchle, Ponte Vedra Beach, and Richard Pierson, Jacksonville, both of Fla., assignors to Xomed, Inc., Jacksonville, Fla.

Filed Sep. 13, 1978, Ser. No. 941,773

Int. Cl.[2] G02B *27/00*

U.S. Cl. 350—65 **12 Claims**



1. In a disposable drape for positioning over an operating microscope and its support arm wherein the drape is fabricated from a thin, flexible, air-impervious film which is adversely affected by the temperatures induced within the drape adjacent the source of illumination of the microscope, the improvement which comprises;

a sheet of flexible material, characterized by its porous open-

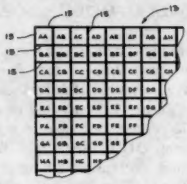
cell structure and its ability to withstand the temperatures induced within the drape adjacent the source of illumination of the microscope, positioned in loose contacting relationship against the inner surface of the drape whereby to provide a heat barrier which shields the drape adjacent said source of illumination from attaining temperatures sufficiently high to adversely affect the drape material.

4,183,614

MICROSCOPE SLIDE

Bernard Feldman, Goleta, Calif., assignor to Liquidata, Inc., Irvine, Calif.

Filed Jan. 10, 1977, Ser. No. 758,058
Int. Cl.² G02B *21/34*
U.S. Cl. 350—94 **10 Claims**



7. A method of making a microscope slide, including the steps of:

applying onto a face of a substantially transparent substrate, a film of a thickness in the range of 500–10,000 angstroms and less transparent than the substrate;

applying a layer of photo sensitive material over said film;

exposing said layer through a mask;

developing said layer to provide a grid pattern of the layer; and

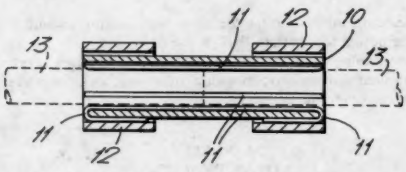
etching a grid pattern in said film through the removed portions of said layer, providing a thin relatively transparent grid pattern of the film on said substrate whereby the grid pattern is at the focussing surface of the substrate when a specimen is on the substrate.

4,183,615

COUPLINGS AND TERMINALS FOR OPTICAL WAVEGUIDES

Derek A. Rush, Emsworth, England, assignor to Smiths Industries Limited, London, England

Filed Mar. 18, 1977, Ser. No. 779,418
Claims priority, application United Kingdom, Mar. 18, 1976, 11021/76
Int. Cl.² G02B *5/14*
U.S. Cl. 350—96.21 **24 Claims**



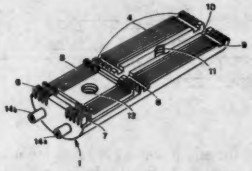
1. An optical waveguide coupling comprising a connector having a longitudinal bore and a pair of optical waveguides whose ends are disposed in opposite ends of the longitudinal bore with the waveguide ends optically coupled to one another, wherein the connector comprises a generally tubular body and a multiplicity of flexible elongate members mounted on the tubular body and extending longitudinally therethrough to define the said longitudinal bore, the elongate members being spaced apart around the tubular body and being individually displaceable towards the tubular body, and wherein the flexible elongate members are displaced towards the tubular body by the said ends of the optical waveguides and resiliently engage the ends of the optical waveguides to maintain them in alignment with one another.

4,183,616

CONNECTOR FOR CONNECTING TWO GROUPS OF OPTICAL FIBRES

Pierre-Alain Benoit, Boudry, and Gilbert Widmer, Bienne, both of Switzerland, assignors to Societe d'Exploitation des Cables Electriques, Cortaillod; S.A. des Cableries et Trefileries de Cossonay, Cossonay-Gare and Kabelwerke Brugg AG, Brugg, all of, Switzerland

Filed Jul. 15, 1977, Ser. No. 816,204
Claims priority, application Switzerland, Jul. 20, 1976, 9270/76
Int. Cl.² G02B *5/14*
U.S. Cl. 350—96.20 **10 Claims**



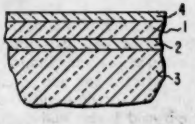
1. A connector for connecting two groups of optical fibres provided with a sheath or protection coating comprising a support piece provided with longitudinal grooves, a first locking piece and means for fixing it over a first part of the length of the grooves at one first end of the connector to retain and lock the unstripped fibres in the said first part of the grooves, and a second locking piece and means for fixing it over a second part of the length of the grooves at the opposite end of the connector to retain and lock the stripped fibres in the said second part of the grooves, the upper parts of the grooves having throughout their length a width sufficient to enable the unstripped fibres to be placed in those grooves and having vertical inner walls the bases of the support piece grooves being of V cross-section at the said first end of the connector and the second locking piece comprising at said end a comb of longitudinal bars of shape complementary to said grooves, the bars being of a deformable material thus allowing deformation of said bars under the pressure exerted by the fixing means of the second locking piece on the optical fibres during locking.

4,183,617

THIN FILM AS_2S_5 OPTICAL WAVE GUIDE

Thelma J. Isaacs, Murrysville, and Milton Gottlieb, Churchill Borough, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Feb. 9, 1978, Ser. No. 876,398
Int. Cl.² G02B *5/14*; B01J *27/02*
U.S. Cl. 350—96.12 **31 Claims**



31. Amorphous As_2S_5 having an index of refraction of about
2.224 at 0.5660 μm,
2.150 at 0.5770 μm,
2.204 at 0.5990 μm,

2.199 at 0.6328 μm,
2.194 at 0.6350 μm,
2.186 at 0.6580 μm,
2.145 at 1.554 μm,
2.130 at 2.66 μm,
2.128 at 3.38 μm, and
2.119 at 5.3 μm.

4,183,618

COUPLINGS AND TERMINALS FOR OPTICAL WAVEGUIDES

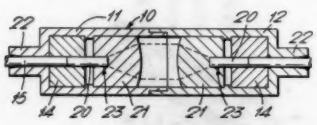
Derek A. Rush, Emsworth, and Anthony J. Thornton, Wembley, both of England, assignors to Smiths Industries Limited, London, England

Continuation-in-part of Ser. No. 779,418, Mar. 18, 1977. This application Aug. 8, 1977, Ser. No. 822,855

Claims priority, application United Kingdom, Aug. 6, 1976, 32817/76

Int. Cl.² G02B *5/14*

U.S. Cl. 350—96.18 **11 Claims**



1. A terminal for an optical waveguide including a connector comprising a generally tubular body and a multiplicity of flexible elongate members mounted on the body, the flexible elongate members being spaced apart around the body and extending longitudinally therethrough to define a longitudinal bore in which an end of an optical waveguide is to be anchored, lens means for transmitting light from one end of the waveguide and defining a recess including a focal point of the lens means, and a housing in which the connector and lens means are mounted, wherein the terminal further includes an elongate optical member having first and second ends with respective end faces, the first end of the elongate optical member extending partially through the longitudinal bore of the connector and being resiliently engaged by the flexible elongate members, and the second end of the elongate optical member being mounted in said recess in the lens means with its said end face disposed at said focal point of the lens means.

4,183,619

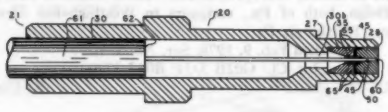
CONNECTOR PIN ASSEMBLY AND METHOD FOR TERMINATING AN OPTICAL FIBER

John A. Makuch, Danbury, Conn., assignor to Bunker Ramo Corporation, Oak Brook, Ill.

Filed Jun. 15, 1977, Ser. No. 806,953

Int. Cl.² G02B *5/14*

U.S. Cl. 350—96.21 **10 Claims**



1. A connector pin assembly for concentrically aligning and terminating an optical fiber of a fiber optic cable with respect to the outer dimension of said pin comprising:

a body having a forward end and a rear end, an opening extending from said forward end to said rear end completely through said body, said opening being defined along at least a portion of its length extending inwardly from said forward end by an inner wall, said inner wall being concentric with the outer dimension of said forward end of said body; and

a plurality of pin members within said opening arranged in side-by-side relation to define a central passageway, said pin members being dimensioned for substantially tangential contact with said inner wall, substantially tangential contact with each other, and locating said optical fiber in said central passageway such that said optical fiber is held concentrically with respect to the outer dimension of said forward end of said body.

4,183,620

JOINT DOPED POROUS GLASS ARTICLE WITH HIGH MODIFIER CONCENTRATIONS

Pedro B. Macedo, 6100 Highboro Dr., Bethesda, Md. 20034; Mrinmay Samanta, Washington, D.C., and Joseph H. Simmons, Potomac, Md., assignors to Pedro Buarque De Macedo, Bethesda and Theodore Aaron Litovits, Silver Spring, both of, Md.

Filed Dec. 30, 1976, Ser. No. 755,590

Int. Cl.² G02B *5/14*; C03C *3/04, 25/02*

U.S. Cl. 350—96.30 **8 Claims**

1. A glass article having a center and a surface, said article having a composition comprising at least 85 mole percent of SiO_2, from 7 to 25 weight percent of at least one dopant member selected from the group (I) consisting of PbO and Bi_2O_3 and from 1.5 to 9 mole percent of at least one dopant member selected from the group (II) consisting of K_2O, Rb_2O and Cs_2O in said center and decreasing amounts of said dopant members of groups (I) and (II) away from said center and an increasing SiO_2 concentration away from said center as said surface is approached.

4,183,621

WATER RESISTANT HIGH STRENGTH FIBERS

Charles K. Kao, and Mokhtar S. Maklad, both of Roanoke, Va., assignors to International Telephone and Telegraph Corporation, Nutley, N.J.

Filed Dec. 29, 1977, Ser. No. 865,643

Int. Cl.² G02B *5/14*

U.S. Cl. 350—96.30 **8 Claims**

1. An optical communication fiber having improved fatigue resistance comprising:

an optical fiber core of a glass material having a first index of refraction;

a cladding material over the glass core having an index of refraction lower than that of the core; and

a water impervious carbon layer over the cladding layer to prevent atmospheric moisture from reaching the surface of the cladding layer.

4,183,622

SOLAR BEACON

Albert Malgarin, 4218 S. 248th St., Kent, Wash. 98031

Filed Jan. 23, 1978, Ser. No. 871,427

Int. Cl.² G02B *5/12*

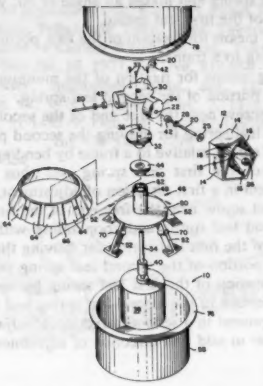
U.S. Cl. 350—99 **7 Claims**

1. An aircraft solar beacon for improving aircraft visibility, comprising:

a plurality of reflector arrays each having a plurality of individual reflectors; and

drive means for rotating said reflector arrays about respec-

tive first rotational axes extending radially from a common center while moving said reflector arrays about a



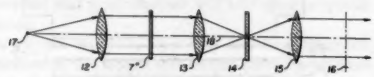
second rotational axis around said common center in a circular path.

4,183,623

TOMOGRAPHIC CROSS-SECTIONAL IMAGING USING INCOHERENT OPTICAL PROCESSING

Kenneth A. Haines, General Delivery, Silverado Canyon, Calif. 92676

Filed Oct. 11, 1977, Ser. No. 840,995
Int. Cl.[2] G02B *27/38;* G03B *41/16*
U.S. Cl. 350—162 SF **5 Claims**



1. A method of constructing cross-sectional images from tomographic back-projection transparencies (layergrams), comprising the steps of:

providing a substantially point source of temporally incoherent (polychromatic) radiation, thereby to provide a beam of radiation emanating from said point,

placing a Fourier Transforming lens in the path of said beam of radiation in such a manner that the substantially point source is caused to come to focus in a Fourier plane,

constructing a back-projection transparency,

placing said back-projection transparency on either side of the aforementioned lens such that an essentially Fourier Transform of said back-projection transparency is formed in the Fourier plane,

constructing a spatial filter transparency which is scale invariant, except for a constant multiplier,

placing said spatial filter transparency in the Fourier plane, and

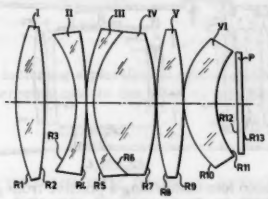
producing an image of said spatial filtered back-projection transparency which is a cross-sectional image.

4,183,624

LENSES

Philip J. Rogers, Meliden, and Michael Roberts, Abergele, both of Wales, assignors to Pilkington P. E. Limited, St. Helens, England

Filed Dec. 6, 1976, Ser. No. 747,516
Claims priority, application United Kingdom, Dec. 18, 1975, 51923/75
Int. Cl.[2] G02B *9/60*
U.S. Cl. 350—175 E **15 Claims**



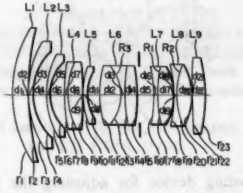
1. A biocular magnifying lens faster than F/1.0 having a front part which in use faces towards the eyes, a middle part, and a back part which in use faces towards the object, the front part comprising at least two elements including a positive element disposed in front of and spaced from a singlet element having a negative focal length which has a concave front surface, the middle part being convergent, and the back part being convergent and comprising at least two elements including a positive element disposed in front of a rear positive element, said rear positive element being meniscus in shape convex towards the front and having a divergent rear surface.

4,183,625

WIDE-ANGLE PHOTOGRAPHIC OBJECTIVE

Teruyoshi Tsunashima, Kawasaki, Japan, assignor to Nippon Kogaku K. K., Tokyo, Japan

Filed Aug. 29, 1977, Ser. No. 828,911
Claims priority, application Japan, Aug. 31, 1976, 51-103137
Int. Cl.[2] G02B *13/04*
U.S. Cl. 350—207 **8 Claims**



6. In a wide-angle photographic objective comprising a diaphragm, a front lens group positioned at the object side and a rear lens group positioned at the image side, the diaphragm being interposed between said lens groups, the improvement wherein the front lens group comprises a positive meniscus component having its surface convex to the object side, at least two negative meniscus lens components having their surfaces convex to the object side and at least one positive lens component, and wherein the rear lens group consists of, in the order from the object side, two meniscus lens components each having their surfaces convex to the image side and comprising a biconcave and a biconvex lens cemented together, and one position lens component.

4,183,626

LENSES

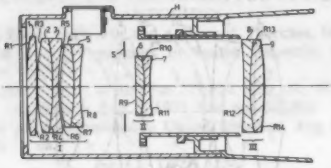
Philip J. Rogers, Clwyd, Wales, assignor to Pilkington P. E. Limited, St. Helens, England

Filed Sep. 20, 1977, Ser. No. 834,990

Claims priority, application United Kingdom, Sep. 24, 1976, 39882/76

Int. Cl.[2] G02B *9/60*

U.S. Cl. 350—216 **30 Claims**



1. A telephoto lens comprising a positive front group of lens elements including at least one positive doublet consisting of a positive element of a crown glass type in front of a negative element of a flint glass type having a positive red relative partial dispersion coefficient deviation, a negative middle group of lens elements comprising a positive lens element of a crown glass type and a negative lens element of a flint glass type having a positive red relative partial dispersion coefficient deviation, a rear positive part comprising at least one lens element well separated from the negative middle group, and an aperture stop for limiting the light rays from said front group of lens elements which are transmitted through said middle group of lens elements.

4,183,627

ADJUSTING DEVICE FOR ADJUSTING THE POSITION OF AN OPTICAL OR OPTO-ELECTRONIC COMPONENT IN TWO DIRECTIONS OF ADJUSTMENT WHICH ARE PERPENDICULAR TO EACH OTHER

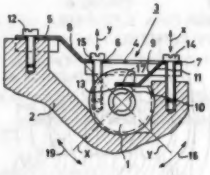
Eduard Camerik, Eindhoven, Netherlands, assignor to U.S. Phillips Corporation, New York, N.Y.

Filed Jun. 1, 1978, Ser. No. 911,211

Claims priority, application Netherlands, Feb. 27, 1978, 7802131

Int. Cl.[2] G02B *7/02*

U.S. Cl. 350—252 **4 Claims**



1. An adjusting device for adjusting the position of an optical or opto-electronic component, such as a lens or a plate provided with a plurality of light-sensitive semiconductor diodes, relative to a frame, in two directions of adjustment (X–Y) which are perpendicular to each other, the component being connected to a mounting element, such as a lens mount or a mounting plate, characterized in that the device comprises:

a first leaf spring, comprising a first flat portion for fixation of the device to a frame, and parallel to the first portion a second flat portion having a free end, as well as a third portion which makes an angle of 45° with and also constitutes a connection between the said first and second portions,

a second leaf spring, connected to the first leaf spring and comprising a first portion for fixation of the mounting element to the device and having a free end, as well as second portion which makes an angle of 45° with and also constitutes a connection with the second portion of the first leaf spring and makes an angle of 90° with the third portion of the first leaf spring,

first fixing means for fixation of the first portion of the first leaf spring to a frame,

second fixing means for fixation of the mounting element to the first portion of the second leaf spring,

a first set screw near the free end of the second portion of the first leaf spring for moving the second portion of the first leaf spring relative to a frame by bending of the third portion of the first leaf spring and thus moving the component in a first direction of adjustment, and

a second set screw near the free end of the first portion of the second leaf spring and cooperating with the second portion of the first leaf spring for moving the free end of the first portion of the second leaf spring relative to the second portion of the first leaf spring by bending of the second portion of the second leaf spring and thus moving the component in a second direction of adjustment, perpendicular to said first direction of adjustment.

4,183,628

ELECTRONIC WATCH AND DISPLAY DEVICE FOR SUCH WATCH

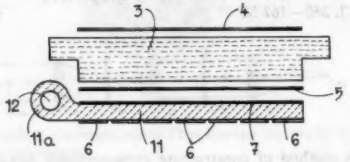
Claude Laesser, La Chaux-de-Fonds; Rene Viennet, Neuchatel, and Eric Saurer, Bevaix, all of Switzerland, assignors to Ebauches S.A., Switzerland

Filed May 13, 1977, Ser. No. 796,525

Claims priority, application Switzerland, May 20, 1976, 6334/76; May 20, 1976, 6335/76

Int. Cl.[2] G02F *1/13*

U.S. Cl. 350—338 **4 Claims**



1. A combination liquid crystal display and electrical generator comprising, a partially transparent liquid crystal display cell having front and rear surfaces for viewing from the front; a plurality of photoelectric cells located to the rear of said display cell and sensitive to light waves within a first frequency band corresponding to at least the color red; and a semi-transparent mirror located between said display cell and said photoelectric cells and adaped to transmit light waves within a second frequency band including wave lengths corresponding to at least the color red and reflect light waves within a third frequency band including wave lengths corresponding to at least the color blue, whereby the reflected light in the third frequency band corresponds to the band of light to which the human eye is most sensitive for maximizing the brightness of the display, and the transmitted light in the second frequency band corresponds to the band of light to which the photocells are most sensitive for maximizing the energy produced by the photoelectric cells.

4,183,629
ELECTRONIC OPTICAL DISPLAY DEVICE AND METHOD OF MANUFACTURING THE SAME

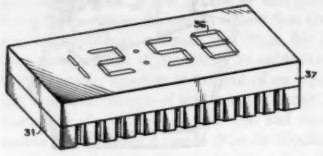
Katsuo Nishimura, Tokorozawa; Hisao Wakabayashi; Takatoshi Osaka, both of Higashikurume; Kazunari Kume, Tokorozawa; Yasuhiro Ogura, Tokyo, and Yukio Miya, Tokorozawa, all of Japan, assignors to Citizen Watch Co. Ltd., Tokyo, Japan

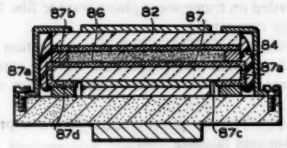
Filed Jul. 14, 1977, Ser. No. 815,684

Claims priority, application Japan, Jul. 21, 1976, 51-97303[U]; Aug. 12, 1976, 51-96401; Dec. 7, 1976, 51-146201; Dec. 13, 1976, 51-149579; Dec. 13, 1976, 51-149580

Int. Cl.[2] G02F *1/13*

U.S. Cl. 350—334 **10 Claims**





1. An electro-optical display device comprising

(a) a first substrate having at least one side and a face perpendicular to said side;

(b) a second substrate having at least one side and a face and having the same size and configuration as said first substrate, the face of said second substrate mounted opposite the face of said first substrate thereby forming a gap therebetween;

(c) an electro-optical substance sealed within the gap formed between said substrates;

(d) a first electrode attached to the face of said first substrate between said first substrate and said electro-optical substance;

(e) a second electrode opposing said first electrode and attached to the face of said second substrate between said second substrate and said electro-optical substance;

(f) a lead electrode connected to said first electrode and mounted to and extending along said at least one side of said first substrate; and

(g) an insulating, protective film covering said lead electrode.

4,183,630
TWISTED NEMATIC FIELD EFFECT MODE LIQUID CRYSTAL DISPLAY

Fumiaki Funada; Kiyoshi Toda, both of Yamatokoriyama; Masataka Matsuura, Tenri, and Tomio Wada, Nara, all of Japan, assignors to Sharp Kabushiki Kaisha

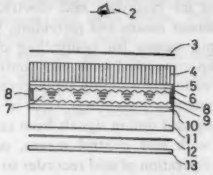
Filed Oct. 27, 1978, Ser. No. 955,335

Claims priority, application Japan, Oct. 31, 1977, 52-131368

Int. Cl.[2] G02F *1/13*

U.S. Cl. 350—334 **3 Claims**

1. A twisted nematic field effect mode liquid crystal display cell comprising a liquid crystal layer sandwiched between first and second substrates, and a polarizer positioned in front of said first substrate, said first substrate comprising;



a fiber plate including a plurality of optical fibers of which axes are perpendicular to the plane of said liquid crystal layer.

4,183,631
ELECTROCHROMIC DISPLAY DEVICE

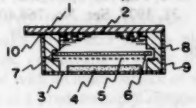
Shigeo Kondo; Nobuyuki Yoshiike, both of Hirakata, and Masakazu Fukai, Nishinomiya, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Jan. 4, 1978, Ser. No. 867,183

Claims priority, application Japan, Jan. 10, 1977, 52/001667

Int. Cl.[2] G02F *1/17*

U.S. Cl. 350—357 **9 Claims**



1. In an electrochromic device comprising a display electrode, a counter-electrode and an electrolyte containing an electrochromic material capable of reversibly displaying color all contained within a cell,

the improvement wherein said counter-electrode is made of porous metal which is electrochemically irreversible and wherein said electrolyte is an aqueous solution containing metal ions of said counter-electrode, whereby the electrochemical reaction on said counter-electrode is a charge-and-discharge reaction of an electric double layer formed on the surface of said counter-electrode.

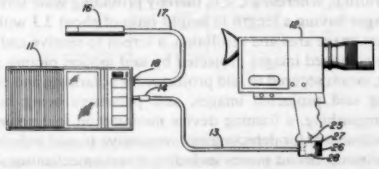
4,183,632
ELECTRONIC SYSTEM FOR SYNCHRONIZING MOTION PICTURE AND SOUND RECORDINGS

Donald W. Nutting, and Steven F. Nugent, both of Boulder, Colo., assignors to Comput-A-Sound Corporation, Boulder, Colo.

Filed Jun. 21, 1976, Ser. No. 699,006

Int. Cl.[2] G03B *31/00*

U.S. Cl. 352—17 **35 Claims**



1. A system for synchronizing motion picture and sound recordings, said system comprising:

sensor means for sensing film movement in a movie camera during filming of a motion picture and in a movie projec-

tor during playback of said filmed motion picture, said sensor means producing electrical output signals indicative of sensed film movement; and

control means for receiving said electrical output signals from said sensor means and providing, when in a filming mode, output signals for controlling operation of a recorder when connected with said control means and for causing recording of a timing signal on said recorder, said control means also providing, when in a playback mode and receiving said timing signals from said recorder when connected with said control means, output signals for controlling operation of said recorder to achieve synchronization of sound recorded on said recorder with the motion picture produced by said projector during playback.

4,183,633

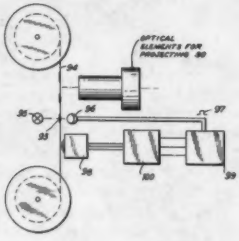
MOTION PICTURE FILM FOR THREE DIMENSIONAL PROJECTION

Arthur P. Kent, and Mortimer Marks, both of New York, N.Y., assignors to Marks Polarized Corporation, Whitestone, N.Y.

Continuation-in-part of Ser. No. 524,798, Nov. 18, 1974, Pat. No. 4,017,166, which is a continuation-in-part of Ser. No. 329,733, Feb. 5, 1973, Pat. No. 3,851,955. This application Jan. 31, 1977, Ser. No. 764,404

Int. Cl.[2] G03B *35/08*

U.S. Cl. 352—60 **1 Claim**



1. A motion picture projection system for the projection of 3-dimensional pictures comprising a single lens motion picture projector, a single strip motion picture film including a succession of frames of conventional height having a width H_1, a separator line between adjacent ones of said frames having a width a, each of said frames having substantially the entire area thereof occupied by a right image and a left image positioned therewithin, an indicia mark on said film disposed outside of the image area to predetermine the location of the right and left images, a dark bar positioned at the center of said frame juxtaposed between said left image and said right image and having a width b, wherein $a << b$, thereby providing wide screen 3-D images having a length to height ratio of about 2.3 with maximum image area and resolution, a screen to receive and reflect the polarized images projected by said motion picture projector, means secured to said projector for polarizing and overlapping said projected images, said polarizers being mutually extinguishing, a framing device mounted on said projector, a photo sensor for detecting and responsive to said indicia mark, electronic circuit means including a servomechanism secured to said framing device, and sensor being effective to produce a signal, and means for supplying said signal to said servomechanism via said electronic circuit for adjusting said framing device, whereby a true stereo presentation is obtained, and a pseudo stereo image presentation is avoided, on said screen.

4,183,634

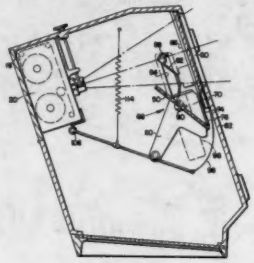
REAR PROJECTION VIEWER HAVING SMALL AUXILIARY SCREEN

Gerald H. Cook, Lynnfield, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Dec. 30, 1977, Ser. No. 865,787

Int. Cl.[2] G03B *21/10*

U.S. Cl. 352—104 **25 Claims**



1. Photographic apparatus for projection of an image of given size recorded on transparent photographic film for viewing of the image comprising:

a housing defined in part by a first rear projection viewing screen and a second rear projection viewing screen, said second screen being substantially smaller than said first screen;

means for supporting the photographic film in a projection plane within said housing; and

means, including a single projection lamp and projection lens assembly for alternately projecting the image onto said first screen or onto said second screen with the image substantially filling said first or second screen in either instance, whereby said image may be viewed on said first screen under normal ambient lighting conditions and on said second screen under substantially higher ambient lighting conditions.

4,183,635

MOTION-PICTURE CAMERA WITH LONG-TERM EXPOSURE

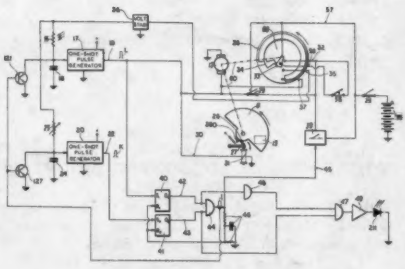
Franz Dörig, Great Neck, N.Y., assignor to Bolex International SA, Ste. Croix, Switzerland

Filed Apr. 14, 1978, Ser. No. 896,585

Claims priority, application Switzerland, Apr. 15, 1977, 4694/77

Int. Cl.[2] G03B *7/08*

U.S. Cl. 352—141 **10 Claims**



1. In a motion-picture camera provided with an objective for the illumination of successive frames of a film, a shutter in line with said objective having an unblocking position enabling such illumination and a blocking position obstructing the light

path from the objective to the film, and drive means coupled with said shutter for moving same into its blocking position during advances of the film from one frame to the next,

the combination therewith of:

first timing means including a photosensitive element for measuring an exposure interval of a duration varying inversely with available luminous intensity;

second timing means including an adjustable impedance element for measuring a selected recurrence period; and

a control circuit coacting with said drive means for placing said shutter in its unblocking position and activating said first and second timing means at the start of an operating cycle coinciding with the beginning of an exposure interval, a first branch of said control circuit being connected to the output of said first timing means and responsive to a signal therefrom for initiating a movement of said shutter from its unblocking position to its blocking position at the end of an exposure interval, a second branch of said control circuit being connected to the outputs of said first and second timing means for initiating a return from its blocking position to its unblocking position in response to a combination of signals from both said timing means to start another operating cycle.

4,183,636

PROJECTION SYSTEM

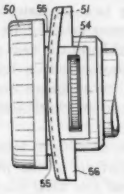
Walter Besenmatter, Vienna; Günter Kurz, Vösendorf; Otto Metzler, and Trude Muszumanski, both of Vienna, all of Austria, assignors to Karl Vockenhuber and Raimund Hauser, both of Vienna, Austria

Filed May 8, 1978, Ser. No. 903,541

Claims priority, application Austria, May 9, 1977, 3267/77

Int. Cl.[2] G03B *5/02*

U.S. Cl. 353—101 **9 Claims**



1. An optical system for directing converging light rays from points of an image carrier onto a receiving surface, comprising:

an objective housing;

a projection objective in said housing including a front lens member proximal to said receiving surface and a rear component proximal to said carrier, said rear component being centered on an axis perpendicular to said image carrier;

a support for said front lens member displaceable in a predetermined axial plane in a direction generally parallel to said image carrier;

stationary mounting means for said rear component in said housing; and

adjustment means for transversely displacing said support within said plane, between limits maintaining a portion of said front lens member in the path of a light beam emanating from said rear component, to shift the converging light rays in said axial plane.

4,183,637

METHOD AND APPARATUS FOR FORMING PHOSPHOR SCREEN OF COLOR PICTURE TUBES

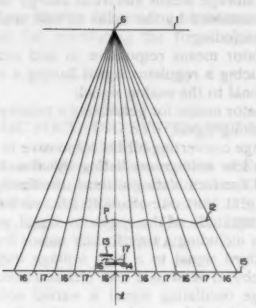
Takehiko Ueyama; Masahiro Nishizawa, both of Mobara; Eiichi Yamazaki, Ichihara, and Iwao Ogura, Tokyo, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Oct. 28, 1977, Ser. No. 846,536

Claims priority, application Japan, Nov. 12, 1976, 51-135301; Nov. 29, 1976, 51-142281

Int. Cl.[2] G03B *41/00*

U.S. Cl. 354—1 **12 Claims**



11. An apparatus for forming a phosphor screen of a color picture tube through irradiation with a plurality of virtual linear light sources, comprising a single linear light source disposed in parallel with an inner surface of a face plate of said color picture tube at a predetermined distance from said inner surface, and a prism device including a plurality of prisms juxtaposed adjacent to each other and interposed between said inner surface and said light source so that said light source gives an appearance of a plurality of virtual light sources when observed from every point on the inner surface of said face plate, each of said prisms providing a pair of virtual linear light sources, each having the same width and uniform intensity distribution.

4,183,638

EXPOSURE CONTROL SYSTEM FOR PHOTOCOMPOSITION MACHINES

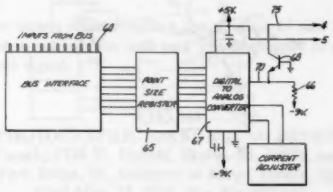
Thomas A. Booth, Flanders, N.J., and Frank L. Scholten, Katonah, N.Y., assignors to AM International, Inc., Los Angeles, Calif.

Division of Ser. No. 654,930, Feb. 3, 1976, Pat. No. 4,046,475.

This application Sep. 2, 1977, Ser. No. 830,130

Int. Cl.[2] B41B *13/00*

U.S. Cl. 354—7 **12 Claims**



1. In a photocomposition machine comprising continuously movable font means for successively presenting individual characters of at least one font of characters at a projection location and variable magnification lens means for projecting an individual character of said font means at a selected point size to a photosensitive receptor, an exposure control system comprising:

a projection light source means for producing a light flash during movement of said individual character through the projection location, said light flash having an output intensity variable relative to an applied electrical energy;

means for storing a digital number having a value alterable in response to a change in the selected point size;

digital-to-analog conversion means for converting said digital number to an analog signal;

energy storage means for storing electrical energy responsive to a D.C. charging signal;

means responsive to the analog signal for storing in the energy storage means electrical energy having a magnitude determined by the value of said analog signal, said means including:

i. regulator means responsive to said analog signal for producing a regulator signal having a magnitude proportional to the analog signal;

ii. oscillator means for generating a relatively low voltage oscillating signal;

iii. voltage converting means responsive to both said relatively low voltage oscillating signal and said regulator signal for formulating a third, oscillating, input signal having at least one characteristic varied according to the magnitude of the regulator signal, said converting means including a transformer means for transforming said third signal to a high voltage oscillating signal, whereby at least said one characteristic of said high voltage oscillating signal is varied according to the magnitude of the regulator signal; and

iv. rectifying means for rectifying said high-voltage oscillating signal to produce said D.C. charging signal, said rectifying means connected to said energy storage means for charging said energy storage means with a magnitude of energy determined by said one characteristic; and

trigger means for applying the energy stored by said storage means to said light source means when the individual character is in the projection location, whereby the intensity of the light flash can be varied over a wide range by changing the value of the digital number.

4,183,639

FOCUSING SYSTEM

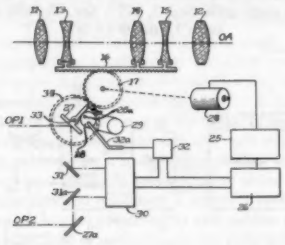
Michiharu Suwa, Fuchu, Japan, assignor to Bell & Howell Company, Chicago, Ill.

Filed Nov. 17, 1977, Ser. No. 853,016

Claims priority, application Japan, Nov. 25, 1976, 51/141591; Nov. 25, 1976, 51/141592; Nov. 25, 1976, 51/141593; Nov. 25, 1976, 51/141594

Int. Cl.[2] G03B 7/08

U.S. Cl. 354—25 **21 Claims**



1. A camera with a zoom lens adapted to be used for automatic and manual focusing which includes a camera body adapted to mount the zoom lens having an optical axis extending from said camera body through a front objective, a first manual focusing system selectively engaged for operation, said first system with a focusing objective moveable along the optical axis and positioned at the distal portion of the optical axis away from said camera body, a second automatic focusing system for mutually exclusive selective engagement when said first system is rendered inoperative, said second system having lens means mounted for movement along the optical axis of the zoom lens for zooming and for focusing said lens means being positioned between said front objective and said camera body, an automatic focusing detection means including a photo sensitive cell being cyclically subjected to light from a subject to detect a peak signal for determining the range of the subject and being associated with said lens means for positioning said lens means for optimum focus.

4,183,640

AUTOMATIC FOCUS ADJUSTING DEVICE

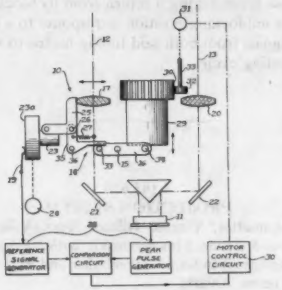
Masao Abe, Tokyo, Japan, assignor to Nihon Beru-Haueru Kabushiki Kaisha, Higashimurayama, Japan

Filed Jan. 23, 1978, Ser. No. 871,727

Claims priority, application Japan, Jan. 28, 1977, 52-007861

Int. Cl.[2] G03B 13/18

U.S. Cl. 354—25 **10 Claims**



1. In a camera with a focusable main lens and automatic rangefinder therefor, wherein the rangefinder includes a photosensitive detector having a surface responsive to light from a subject received along two separate optical paths, and also includes a pulse generator adapted to transmit a peak pulse when the light received from the two paths is in coincidence on the surface of the photosensitive detector, comprising:

a main focusing lens for a camera mounted for fore and aft movement relative to the camera along a main optical axis for focus adjustment,

a first optical system defining a reference path between a subject and the surface of the photosensitive detector having a first optical axis fixed relative to the rangefinder and aimed substantially the same as said main optical axis,

a second optical system defining a path along which light may be transmitted from the subject to the surface of the photosensitive detector including a second optical axis movable relative to said first optical axis,

a rangefinder objective lens in said second optical system mounted for regular periodic transverse movement in said second optical system to move said second optical axis and to develop a scanning movement of the light over the surface of the photosensitive detector,

means coupling said main lens and said rangefinder objective lens for shifting the objective lens along its optical axis in response to adjustments in the focus position of the main focusing lens thereby to change the scanning range of the lens and of the light on the surface of the photosensitive detector,

a reference signal generator for generating a periodic signal indicative of a predetermined position of the rangefinder objective lens in its regular periodic transverse movement,

a comparison circuit for receiving pulses from the peak pulse generator and from said reference signal generator and

which provides an output signal corresponding to the time differential between the pulses from the two generators, and

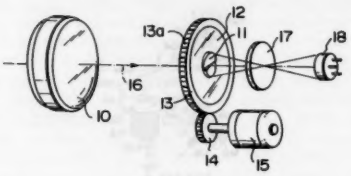
drive means for receiving said output signal from said comparison circuit and for driving the main focusing lens in accordance with said output signal thereby to adjust the focus position and to change the scanning range of said rangefinder objective lens, whereby the time differential between the pulses from the peak pulse generator and from the reference signal generator is affected and said output signal is changed to terminate the drive and to establish proper focus.

4,183,641

FOCUS DETECTING DEVICE

Toshihiro Kondo, Chofu, Japan, assignor to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan, a part interest

Filed Apr. 3, 1978, Ser. No. 892,865
Claims priority, application Japan, Apr. 4, 1977, 52/38262
Int. Cl.[2] G03B *13/18*
U.S. Cl. 354—25 **6 Claims**



1. A device for detecting focus in an optical instrument which has an objective, said device comprising a light refracting optical element located substantially on a focal plane of the objective of the optical instrument, said light refracting optical element having different parts effecting refraction of light in different directions, a transparent disc having disposed therein at the center thereof said light refracting element, means for periodically moving said transparent disc and said optical element in a plane parallel to the focal plane in such a direction so that said different parts of said optical element are periodically brought to a point on said plane parallel to the focal plane, a photodetector located behind said light refracting optical element, and means for focusing on said photodetector an image of the image focused by said objective, wherein said photodetector comprises a central element for measuring the brightness of the central part of the image focused by said focusing means and a marginal element for measuring the brightness of the part of said image adjacent to said central part thereof, and said device further comprises means for compensating the output of said central element of the photodetector by the output of said marginal element of the photodetector.

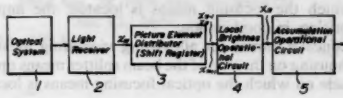
4,183,642

AUTOMATIC FOCUSING DEVICES

Kenji Fukuoka, Fussa, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Jun. 29, 1978, Ser. No. 920,377
Claims priority, application Japan, Jul. 1, 1977, 52-78849
Int. Cl.[2] G03B *3/10, 7/08*
U.S. Cl. 354—25 **6 Claims**

1. An automatic focusing device, comprising: means for generating a focus signal from the photoelectrically determined brightness values of picture elements to control a means for moving the focusing member of an optical system until the focus signal reaches a maximum; means for obtaining m ($m \geqq 3$) brightness values of m adjacent picture elements; means for calculating the difference of $(m-1)$th order (Xn) for a certain number (N) of picture elements; means for calculating $Y(a)=\Sigma X_n{}^p(a)$ and for corresponding calculation of Y(b), the indices (a), (b) designating a certain position of the means for obtaining the brightness values with respect to the optical



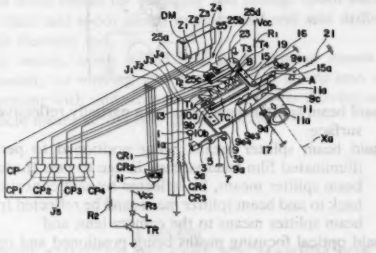
system and the exponent p designating an integer unequal to zero; and means for calculating the focus signal $Z=Y(a)-Y(b)$.

4,183,643

AUTOMATIC FOCUSING SYSTEM FOR USE IN CAMERA

Toshinori Imura, and Akira Yamanaka, both of Sakai, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Oct. 24, 1978, Ser. No. 954,175
Claims priority, application Japan, Oct. 27, 1977, 52-129430
Int. Cl.[2] G03B *3/10*
U.S. Cl. 354—25 **14 Claims**



1. An automatic focusing system for use in a camera, comprising:

a camera objective lens including a movable lens element movable along the optical axis of the objective lens to change the focusing thereof;

focus signal generating means for generating, prior to the movement of said lens element, a focus signal indicative of the axial position of said lens element for focusing said objective lens on a desired target object;

a discriminator coupled to said focus signal generating means for producing a substitute signal indicative of a particular position of the lens element when said focus signal generating means fails to produce said focus signal; and

control means for controlling the position of said lens element in accordance with said focusing signal or said substitute signal.

4,183,644

PHOTOGRAPHIC BACKGROUND DEVICE

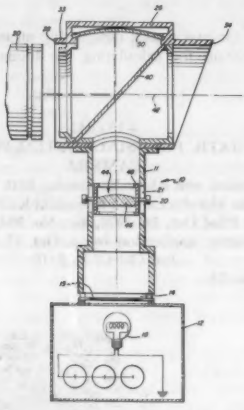
Albert Tureck, 3728 W. Enfield, Skokie, Ill. 60076, and Arthur Cox, Park Ridge, Ill., assignors to Albert Tureck, Skokie, Ill.

Filed Mar. 31, 1978, Ser. No. 892,149
Int. Cl.[2] G02B *27/14;* G03B *15/00, 29/00*
U.S. Cl. 354—77 **13 Claims**

1. Apparatus for providing a photographed subject with selected backgrounds, the backgrounds being maintained on film transparencies, the apparatus having a housing with one portion thereof positionable adjacent a camera lens, means carried by the housing for holding a film transparency, means carried by the housing for illuminating the film transparency,

beam splitter means located within the housing, optical focusing means located in the housing between the film transparency and the beam splitter means, said illuminating means located on the side of the film transparency opposite the side on which the focusing means is located, the improvement comprising, in combination:

a concave mirror for alleviating vignetting located in the housing on the side of the beam splitter means opposite the side on which the optical focusing means is located;



said beam splitter means having a partially reflective mirror surface;

said beam splitter means being positioned to permit the illuminated film transparency image to pass through said beam splitter means, be reflected by said concave mirror back to said beam splitter means and be reflected from said beam splitter means to the camera lens; and

said optical focusing means being positioned and operative to produce an intermediate film transparency image in front of said concave mirror.

4,183,645

DATA PRINTING DEVICE FOR PHOTOGRAPHIC CAMERA

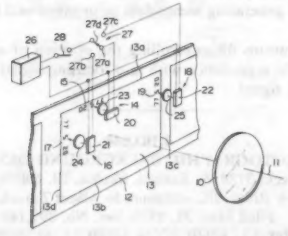
Hiroshi Ohmura, and Hideto Shirane, both of Tokyo, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jun. 6, 1978, Ser. No. 913,059

Claims priority, application Japan, Jun. 7, 1977, 52-66834

Int. Cl.[2] G03B *17/24*; H01H *35/02*

U.S. Cl. 354—106 **6 Claims**



1. A data printing device for a data recording photographic camera in which data such as the photographing date is printed within the image frame of the film when a picture is taken, said device comprising a first data printing system for recording an image of a series of data-representing characters along a first side of the image frame of the film in upright orientation when the camera is held in its normal position, a second data printing system for recording an image of a series of data representing characters along a second side of the image frame of the film adjacent to said first side in upright orientation when the camera body is turned sideways in one direction, and a selecting switch means including a movable contact provided with a weight connected with said first and second printing systems for selectively, by virtue of the weight, actuating said first data printing means when the camera body is held in its normal position and actuating said second data printing means when the camera body is turned sideways in said one direction.

4,183,646

ELECTRICAL SHUTTER OF ELECTROMAGNETIC RELEASE TYPE FOR CAMERA

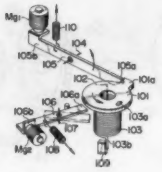
Katsuhiko Tsunefuji, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Aug. 17, 1978, Ser. No. 934,480

Claims priority, application Japan, Nov. 15, 1977, 52-153240[U]

Int. Cl.[2] G03B *9/16, 9/66, 15/03, 17/24*

U.S. Cl. 354—106 **8 Claims**



8. An electrical shutter of the electromagnetic release type for a camera comprising shutter blades, a charging member adapted to rotate about a single shaft in response to a film winding operation to charge a prime mover spring which is used to drive the shutter, a shutter drive member responsive to an electromagnetic release by rotating through substantially one revolution under the resilience of the prime mover spring to open and close said shutter blades, a locating member for maintaining the shutter drive member at rest at its start position before the shutter is operated, detent means cooperating with the charging member to constrain the locating member during the time the prime mover spring is being charged to maintain the shutter drive member in engagement with the locating member, an electrical shutter circuit including a first shutter release electromagnet and a second electromagnet controlling the shutter closing operation for automatically controlling a period of time during which shutter blades are maintained in their open position as a result of rotation of the shutter drive member; first and second normally-open switches which are respectively associated with a data entry unit and a strobo unit; means responsive to said shutter drive member for closing said first and second normally-open switches when said shutter blades are in a fully open position.

4,183,647

ELECTRONIC FLASH APPARATUS

Kaoru Kuraishi, Tokyo, Japan, assignor to Toshiba Photo Products Co., Ltd., Tokyo, Japan

Filed Oct. 5, 1978, Ser. No. 948,969

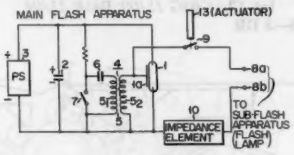
Claims priority, application Japan, Oct. 11, 1977, 52-136011

Int. Cl.[2] G03B *15/05*

U.S. Cl. 354—132 **4 Claims**

1. An electronic flash apparatus comprising: a power source; a capacitor connected in parallel with said power source; a trigger circuit connected with said capacitor and having a synchron-contact interlocking with the shutter of a camera, said trigger circuit producing a high voltage when said synchro-contact is closed; a flash discharge tube connected in

parallel with said capacitor and triggered in response to the high voltage produced by said trigger circuit to flash by a discharge of said capacitor through said discharge tube; first contacts with which second contacts of a sub-flash apparatus with a flash lamp come into contact when said sub-flash apparatus having said second contacts connected to said flash lamp is externally attached to said electronic flash apparatus; and switch means to connect said first contacts to said trigger circuit when said sub-flash apparatus is attached to said electronic flash apparatus.

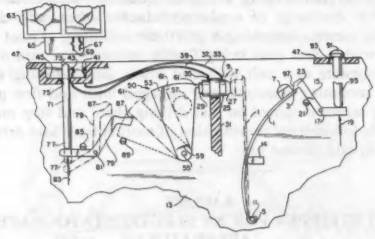


4,183,648

SYNCHRONIZING MECHANISM FOR FLASH FIRING AND SHUTTER ACTUATION

Donald M. Harvey, Webster, and Dana W. Wolcott, Brockport, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 29, 1978, Ser. No. 891,082
Int. Cl.[2] G03B *15/03*
U.S. Cl. 354—135 **3 Claims**



1. In photographic camera apparatus of the type wherein (a) a shutter member is actuatable to initiate a film exposure and (b) a piezoelectric generator receives a mechanically induced shock to produce an electrical pulse for flash firing, the improvement comprising:

means disposing said piezoelectric generator in shock transferring relationship with said shutter member;

means mounting said shutter member for actuation by a mechanical shock received from said piezoelectric generator; and

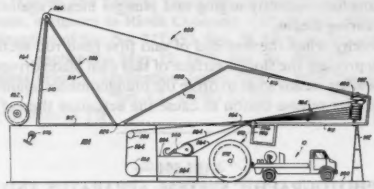
means for striking said piezoelectric generator to mechanically induce a shock in said generator for producing an electrical pulse for flash firing whereby said shock is transmitted by said piezoelectric generator to said shutter member for actuating said shutter member to initiate a film exposure.

4,183,649

OIL DERRICK STRING-UP APPARATUS AND METHODS

Charlie Hartley, Box 95, Durham, Okla. 73642

Filed Apr. 28, 1978, Ser. No. 901,219
Int. Cl.[2] B66C *23/60*
U.S. Cl. 254—139.1 **39 Claims**



1. Apparatus for removing a load carrying drilling cable from a drilling rig, comprising:

a drilling cable storage spool means for receiving and storing said load carrying drilling cable, said spool means being mounted to rotate in place above a ground surface;

friction drive means for engaging said storage spool means to rotate said spool means in place and reel said drilling cable thereon; and

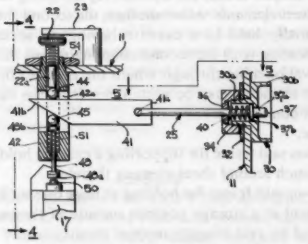
vehicle means, upon which said friction drive means is mounted, for moving said friction drive means into engagement with said storage spool means by moving said vehicle means across said ground surface.

4,183,650

REMOTE SHUTTER RELEASE MECHANISM FOR CAMERA CONTAINED IN SOUNDPROOF HOUSING

Irving Jacobson, 862 Vine St., Hollywood, Calif. 90038

Filed Oct. 3, 1978, Ser. No. 948,207
Int. Cl.[2] G03B *17/38*
U.S. Cl. 354—266 **7 Claims**



1. In a soundproof housing containing a camera having a shutter release button, a shutter release mechanism for actuating said button comprising:

a push rod having first and second sections with the free end of said first section fitted through one wall of said housing and the free end of said second section resiliently supported on another wall of said housing,

a cam blade having an aperture formed therein through which the second section of said push rod is slidably fitted, said cam blade further having a sloped surface at one end thereof,

holder means for receiving said sloped surface portion of said cam blade,

bearing means retained in said holder means on which the cam blade sloped surface portion is supported,

plunger means slidably supported in said holder means extending from said bearing means outside of said holder means to a position directly opposite the shutter release button, and

means for resiliently urging said plunger means against said bearing means,

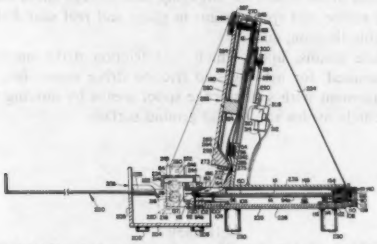
whereby when the free end of said first push rod section is depressed, the sloped surface of said cam blade drives said bearing means so as to drive the plunger means against the shutter release button to cause the actuation thereof.

4,183,651

PHOTOGRAPHIC SYSTEM, APPARATUS AND CASSETTE FOR PROCESSING A SELF-DEVELOPING FILM UNIT

Loring K. Mills, Hampton, N.H., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Nov. 2, 1978, Ser. No. 957,294
Int. Cl.[2] G03D *5/02*; G03B *17/52*
U.S. Cl. 354—304 **25 Claims**



1. Photographic apparatus for coupling together discrete first and second sheet elements of a film unit in preparation for bringing these sheet elements into superposed relation and distributing a fluid processing composition therebetween, the first and second sheet elements having thereon, respectively, first and second means for operatively coupling the first and second sheet elements to one another, the second sheet element being initially held in a cassette having an access opening communicating with the second coupling means thereon and a withdrawal opening through which the coupled first and second sheet elements may be withdrawn from the cassette, said apparatus comprising:

a frame;

means on said frame for supporting a cassette holding at least one such second sheet element therein;

means on said frame for holding at least one such first sheet element at a storage position outside of the cassette supported by said cassette support means;

means for guiding the one first sheet element from the storage position along a path of travel which enters the cassette through the access opening; and

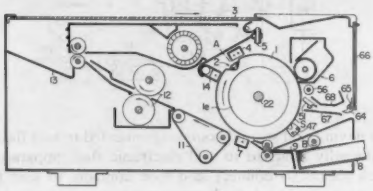
means for advancing the one first sheet element from the storage position, along said path of travel, to a position wherein at least that portion of the one first sheet element having the first coupling means extends into the cassette, through the access opening, and the first coupling means is brought into operative relationship with the second coupling means on the one second sheet element in the cassette to couple the first and second sheet elements to one another so that they may be withdrawn together in superposed relation through the withdrawal opening.

4,183,652

PHOTOCONDUCTOR SHEET CLAMP APPARATUS

Nobuyuki Yanagawa, Chigasaki, Japan, assignor to Ricoh Company, Ltd., Japan

Filed Apr. 25, 1978, Ser. No. 899,856
Claims priority, application Japan, Apr. 30, 1977, 52-50260; May 23, 1977, 52-59633
Int. Cl.[2] G03G *15/00*; B41F *21/04*
U.S. Cl. 355—3 DR **17 Claims**



1. A photoconductor sheet clamp apparatus comprising, in combination, a drum adapted to have a photoconductor sheet wound therearound, and having a recess, at one part of its peripheral surface, extending along a generating line of said peripheral surface; a drum shaft about which said drum is rotatable; a front end clamp member in said recess and operable to clamp the leading end portion of a photoconductor sheet into said recess; front end clamp member operation means operable on said front end clamp member to clamp and unclamp the leading end portion of a photoconductor sheet; a back end clamp member operable to clamp the trailing end portion of a photoconductor sheet in said recess, said back end clamp member being disengageable from said recess and rotatable around the axis of said drum shaft independently of said drum; back end clamp member operation means operable to move said back end clamp member relative to said drum; leading end separation guide means operable to separate the leading end portion of a photoconductor sheet from said drum for discharge of a photoconductor sheet; and drum stopping means operable to stop said drum at a predetermined angular position for unclamping a photoconductor sheet from said drum for discharge of a photoconductor sheet, said drum stopping means comprising a gear train including at least two gears, with a first gear being fixably mounted on said drum shaft to rotate as a unit with said drum, and a driving shaft fixably mounting a second gear engaged with said first gear; driving means mounted on said driving shaft; and stop means operable to interrupt transmission of motion from said driving means to said second gear.

4,183,653

SHEET STRIPPER FOR AN ELECTROSTATOGRAPHIC APPARATUS

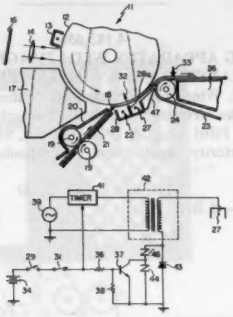
Toyokazu Satomi; Kunio Kudoh, and Tetsuo Sakurai, all of Tokyo, Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Jul. 14, 1978, Ser. No. 924,839
Claims priority, application Japan, Jul. 21, 1977, 52-86700
Int. Cl.[2] G03G *15/00*
U.S. Cl. 355—3 SH **10 Claims**

1. An electrostatographic apparatus including a moving photoconductive member, imaging means for forming an electrostatic image on the photoconductive member, developing means for developing the electrostatic image into a toner image and transfer means for feeding a copy medium into engagement with the photoconductive member and transferring the toner image thereto, characterized by comprising:

corona discharge means operatively disposed adjacent to the photoconductive member downstream of the transfer means in a direction of movement of the photoconductive member; and

voltage source means for applying a first alternating voltage to the discharge means while a leading edge portion of the copy medium passes adjacent to the discharge means, the first alternating voltage being selected to at least partially discharge the leading edge portion and cause the leading edge portion to separate from the photoconductive member;



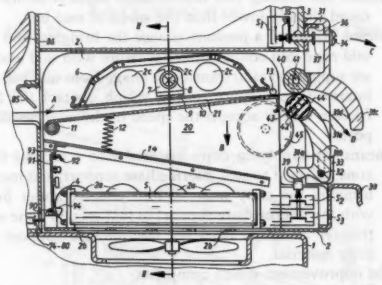
the voltage source means applying a second asymmetrical alternating voltage to the discharge means after the leading edge portion of the copy medium passes the discharge means, the second asymmetrical alternating voltage being selected to partially discharge the copy medium but be insufficient to cause the copy medium to separate from the photoconductive member.

4,183,654

ELECTROSTATIC COPYING MACHINE UTILIZING FLASH DISCHARGE LAMP FOR ILLUMINATING ORIGINAL AND/OR FIXING TONER IMAGE

Fritz Waschk, Unterhaching; Heinz Webersik; Günther Maurischat, both of Munich, and Walter Schott, Zorneding, all of Fed. Rep. of Germany, assignors to AGFA-Gevaert, A.G., Leverkusen, Fed. Rep. of Germany

Filed Dec. 30, 1977, Ser. No. 866,657
Int. Cl.[2] G03G *15/00*
U.S. Cl. 355—3 FU **22 Claims**



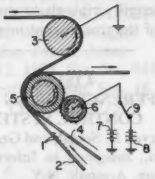
1. In an electrostatic copying machine, in combination, a flash discharge tube; means for causing the discharge tube to produce a flash, including a battery of flash condensors; and safety switch means operative, in response to an attempt to gain physical access to the flash condensors, for automatically effecting the quick discharging of the battery of flash condensors, furthermore including circuit-breaker means operative when tripped for disconnecting the electrostatic copying machine from external power, and means operative in response to tripping of the circuit-breaker means for effecting quick discharging of the battery of flash condensors.

4,183,655

CLEANING MEANS FOR IMAGE TRANSFER UNIT IN ELECTROPHOTOGRAPHIC COPYING MACHINES

Minoru Umahashi, Sagamihara; Hideo Yamazaki, Tokyo; Mitsuo Hasebe, and Tadashi Yamashita, both of Yokohama, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Continuation of Ser. No. 727,853, Sep. 29, 1976, abandoned. This application May 22, 1978, Ser. No. 907,976
Claims priority, application Japan, Oct. 7, 1975, 50-120950
Int. Cl.[2] G03G *15/00*
U.S. Cl. 355—3 TR **10 Claims**



1. A transfer unit for use in an electrophotographic copying machine of the type having a photosensitive member on which a toner image is formed, said unit comprising:

electrically conductive transfer roller means for pressing a transfer sheet against the photosensitive member for transferring a toner image formed on the photosensitive member onto said transfer sheet;

electrically conductive, rotatable cleaning means disposed in abutting relationship with the toner transfer roller means, for cleaning toner therefrom;

electrical bias means for producing a bias voltage of switchable polarity; and

switching means, connecting said bias means to said cleaning means during the transfer of the toner image onto the transfer sheet, for applying a bias voltage of the opposite polarity from that of the toner to the transfer roller means through the cleaning means, such that the toner attaching to the transfer roller means is electrostatically transferred to the cleaning means to clean the transfer roller means, and after completion of an image transfer step, for switching the bias voltage applied to the cleaning means to the same polarity as that of the toner to transfer the toner attaching to the cleaning means back to the photosensitive member through the transfer roller means, thus cleaning both the cleaning means and the transfer roller means while leaving the toner to be subsequently cleaned from said photosensitive member.

4,183,656

SLIT EXPOSURE TYPE COPYING APPARATUS

Toshiaki Ishihara, Toyokawa; Fumitoshi Atsumi, Shizuoka, and Tetsuya Yamada, Aichi, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

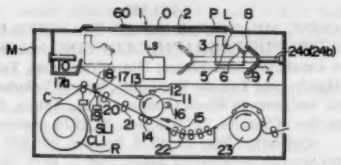
Filed May 4, 1978, Ser. No. 902,710
Claims priority, application Japan, May 13, 1977, 52/55893; Aug. 15, 1977, 52/97951; Aug. 16, 1977, 52/98532
Int. Cl.[2] G03G *15/28*
U.S. Cl. 355—8 **12 Claims**

1. In a slit exposure type copying apparatus in which an original to be copied is successively exposed by an exposure lamp means through a transparent member over which the original is placed, apparatus comprising:

scanning means for scanning the original with said exposure lamp means successively exposing the original;

means for varying the travel distance of said scanning means to enable an increase in the copying speed for producing a

plurality of copies of the same original for shorter length originals than a specified length of original; and



means for restricting the number of exposure illuminations by said exposure lamp means per given unit of time for said shorter length originals to prevent abnormal rise of temperature of the transparent member.

4,183,657

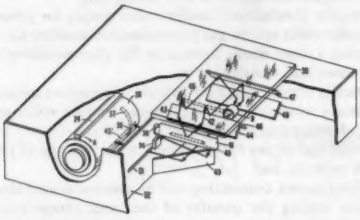
DYNAMIC REFERENCE FOR AN IMAGE QUALITY CONTROL SYSTEM

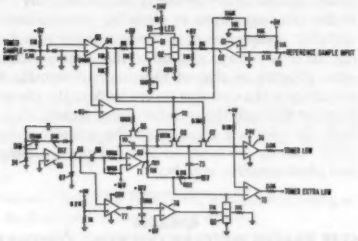
Larry M. Ernst; Steven D. Seigal, and George W. Van Cleave, all of Boulder, Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 10, 1978, Ser. No. 894,955

Int. Cl.[2] G03G *15/00*

U.S. Cl. 355—14 R **9 Claims**





7. Quality control test apparatus for an electrophotographic machine comprising:

a photoconductive material;

charge corona means for charging said photoconductive material;

erase means for discharging a portion of said photoconductive material to establish a discharged test area and a charged test area for a toned sample;

developing means for placing toner on said charged test area to provide said toned sample;

single light-sensitive means for receiving light rays reflected from said discharged test area to establish a reference signal indicative of the light reflecting capability of clean photoconductive material, and for receiving light rays reflected from said toned sample to establish a signal indicative of the light reflecting capability of the developed test area;

comparator means for comparing the sensed reference signal and the sensed toned sample signal to establish an output signal indicative of quality; and

adjusting means for adjusting the sensed reference signal and the sensed toned sample signal to approximately equal each other when the quality level is correct.

4,183,658

COPYING APPARATUS WITH IMAGING BELT AND IMAGE TRANSFER VIA AN INTERMEDIATE SUPPORT

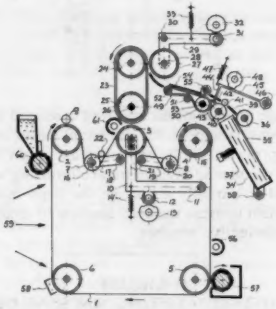
Leon M. W. Winthaegen, Maasbree, Netherlands, assignor to Océ-van der Grinten N.V., Venlo, Netherlands

Filed Aug. 23, 1978, Ser. No. 935,939

Claims priority, application Netherlands, Aug. 29, 1977, 7709486

Int. Cl.[2] G03G *15/00*

U.S. Cl. 355—3 BE **8 Claims**



1. In a copying apparatus comprising

a belt which is movable forward to carry images on the belt to an image transfer zone,

means spaced beyond said zone for guiding said belt,

means spaced ahead of said zone for driving said belt at a substantially constant speed toward said zone,

a movable intermediate support having a surface adapted to receive an image by transfer from said belt in said zone,

means for moving said intermediate support forward at a speed slightly lower than the speed of said belt,

means including a pressure device for bringing said belt in said zone into contact under pressure with said intermediate support so as to transfer an image from said belt to said intermediate support, during which contact the belt by friction locally accepts the speed of the intermediate support,

means for supplying copy material into a second transfer zone adjacent to said intermediate support, and means for bringing the copy material into contact under pressure with the intermediate support in said second zone so as to transfer an image from the intermediate support to the copy material,

the improvement which comprises

a first floating roller engaging a lead of said belt between said belt driving means and said pressure device and exerting a first tensioning force on said belt lead,

a second floating roller engaging a lead of said belt between said pressure device and said belt guiding means and exerting thereon a second belt tensioning force which is greater than said first tensioning force, and

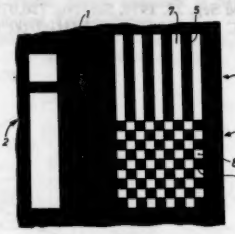
arrest means for limiting the displacement of said floating rollers in response to the greater force exerted by said second floating roller.

4,183,659

MEANS FOR CONTROLLING THE CHANGE OF THICKNESS OF LINES OF PHOTOGRAPHICALLY PRODUCED BRIEFS PRODUCIBLE BY THE AGENCY OF A MEANS FOR PHOTOGRAPHIC REPRODUCTION

Felix Brunner, Corippo, Switzerland

Filed Jun. 27, 1978, Ser. No. 919,575
Claims priority, application Switzerland, Jun. 30, 1977, 8083/77
Int. Cl.[2] G03B *27/52, 27/32*
U.S. Cl. 355—40 4 Claims



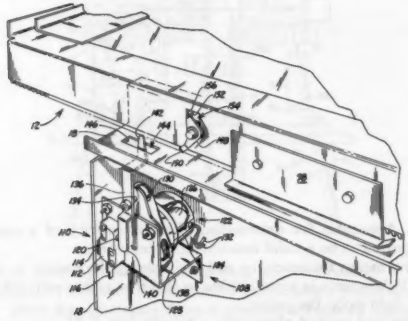
1. A means for determining whether a photographic reproduction of a document falls within predetermined tolerance limits imposed upon changes which may take place upon photographic reproduction of the document in the thickness of a line of a legible character of the document, comprising a control area provided with at least two mutually spaced area elements, the minimum width of each element corresponding to the tolerance imposed on reductions in the thickness of the line and the minimum space between said elements corresponding to the tolerance imposed on increases in the thickness of the line, whereby upon the tolerance imposed on reductions in thickness being exceeded in photographic reproduction of the control area the area elements substantially disappear whereas upon the tolerance imposed on increases in thickness being exceeded in photographic reproduction of the control area the area elements merge into each other across the space therebetween.

4,183,660

TIMING APPARATUS IN A COPIER

David P. Bujese, Toms River, N.J., assignor to Pitney-Bowes, Inc., Stamford, Conn.

Filed Dec. 11, 1978, Ser. No. 968,450
Int. Cl.[2] G03G *15/30*
U.S. Cl. 355—51 10 Claims



1. In a copier including a document transporting carriage movable from a home position through a document illuminating station and back to said home position, and including means for energizing said copier for a predetermined time interval to copy a document on said carriage, timing apparatus for disabling said energizing means comprising:

a. switching means operatively connected to said energizing means for enabling and disabling said energizing means, said switching means being normally operative for enabling said energizing means and being actuatable to disable said energizing means; and

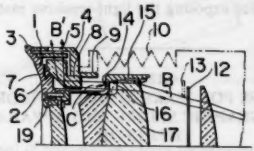
b. means coopertive with said carriage and said switching means for actuating said switching means if said carriage is not moved back to said home position during said predetermined time interval.

4,183,661

ENLARGER LENS SYSTEM HAVING STOP-VALUE SCALE ILLUMINATING MECHANISM

Zenichi Ohkura, Omiya, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 12, 1978, Ser. No. 941,708
Claims priority, application Japan, Sep. 16, 1977, 52-111395
Int. Cl.[2] G03B *27/52*
U.S. Cl. 355—61 10 Claims



1. In an enlarger having a light source, a rear lens group, a rear lens group frame, a lens mounting portion, a light guide positioned between the rear lens group frame and the lens mounting portion and a lens stop-value scale, the improvement comprising: a light transmission window formed in said rear lens group frame and dispersion means disposed on a lens of said rear lens group whereby light from said source passing through said dispersion means will be reflected by said light guide onto said lens stop-value scale.

4,183,662

GRAVITY IMPELLED TRANSPORT FOR ALIGNING AN ORIGINAL IN A COPIER

John F. Bloemendaal, Rochester, and Arthur M. Boone, Pittsford, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

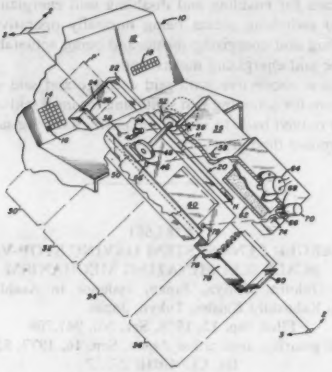
Filed Apr. 3, 1978, Ser. No. 892,611
Int. Cl.[2] G03B *27/62, 27/64*
U.S. Cl. 355—76 9 Claims

1. Apparatus for supporting and guiding a sheet-like, information-bearing original having a face and an edge to a predetermined position in a copier exposure station for exposing light-sensitive material to the original, said apparatus comprising:

means for supporting the original and for guiding movement of the original through the copier to the predetermined position, said supporting means including guiding surfaces inclined with respect to horizontal whereby the face and edge are directed into contact with said guiding surfaces respectively under the influence of gravity to thereby induce guided gravitational movement of the original to the predetermined position;

means disposed adjacent the exposure station for engagement by the original to interrupt movement of the original at the predetermined position;

means for detecting the presence of the original at the predetermined position; and



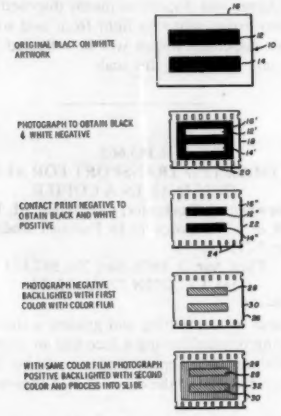
means responsive to detection of the original by said detecting means for exposing the light-sensitive material to the original.

4,183,663

PROCESS FOR MAKING MULTICOLORED PHOTOGRAPHIC SLIDES AND APPARATUS THEREFOR

Robert B. Greenly, 1250 Rembrant Dr., Sunnyvale, Calif. 94087; George A. Paz, 74 Woodhams Rd., Santa Clara, Calif. 95051, and Gerald Tignanelli, 385 S. Pastoria Ave., Sunnyvale, Calif. 94086

Filed Sep. 5, 1978, Ser. No. 939,269
Int. Cl.[2] G03B *27/32, 27/04, 27/42*
U.S. Cl. 355—77 **10 Claims**


ORIGINAL BLACK ON WHITE ARTWORK
PHOTOGRAPH TO OBTAIN BLACK & WHITE NEGATIVE
CONTACT PRINT NEGATIVE TO OBTAIN BLACK AND WHITE POSITIVE
PHOTOGRAPH NEGATIVE BACKLIGHTED WITH FIRST COLOR WITH COLOR FILM
WITH SAME COLOR FILM PHOTOGRAPH POSITIVE BACKLIGHTED WITH SECOND COLOR AND PROCESS INTO SLIDE

1. A process for producing photographic slides from art work having a plurality of portions each to be reproduced in a separate color, said process comprising the steps of:

photographing the art work with black and white film and developing said film to obtain a first black and white negative of the art work;

contact printing said first black and white negative with black and white film and developing said film to obtain a black and white positive of said art work;

back-lighting said first black and white negative with a first color and photographing said back-lighted negative with color film;

back-lighting said black and white positive with a second color and photographing said back-lighted positive with said color film; and

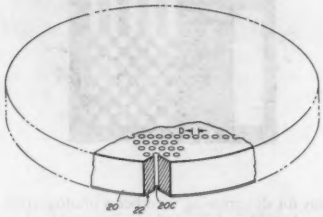
processing said color film into a photographic slide.

4,183,664

OPTICAL APPARATUS

Werner R. Rambauske, Carlisle, Mass., assignor to Raytheon Company, Lexington, Mass.

Filed Sep. 23, 1976, Ser. No. 726,079
Int. Cl.[2] G01C *3/08;* **G01J** *1/32;* **F41G** *3/00;* **G01J** *1/36*
U.S. Cl. 356—4 **3 Claims**



1. Optical apparatus comprising the combination of:

(a) a foraminous plate having substantially nonreflective foramina formed therein;

(b) a conical mirror with a half-apex angle of 45° for concentrating light passing through the foramina, such mirror being disposed to overlie one surface of the foraminous plate; and

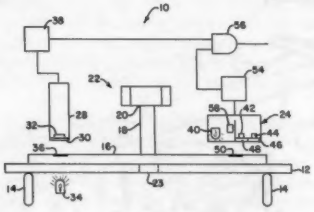
(c) a photodetector disposed along the altitude line of the conical mirror for transducing the concentrated light reflected from the mirror to produce an electrical signal proportional to the amount of such concentrated light.

4,183,665

APPARATUS FOR TESTING THE PRESENCE OF COLOR IN A PAPER SECURITY

Gerald Iannadrea, Painesville, and Robert L. Gorgone, Mentor, both of Ohio, assignors to Ardac, Inc., Willoughby, Ohio

Filed Dec. 7, 1977, Ser. No. 858,115
Int. Cl.[2] G06K *5/00*
U.S. Cl. 356—71 **12 Claims**



1. Apparatus for determining the authenticity of a paper purported to be a valid instrument, comprising:

first means for receiving and maintaining the paper;

a light source in juxtaposition to said first means and casting light upon the paper;

first and second photocells, adjacent said light source, receiving light of predetermined colors reflected from the same areas of the paper and emitting signals proportional to said light received; and

a first comparator circuit means interconnected between

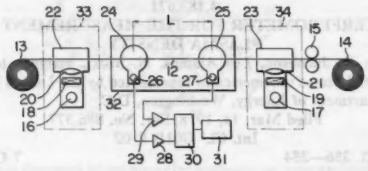
said first and second photocells receiving said signals, and producing a first output signal when the light received by said first photocell is greater than a first percentage and less than a second percentage of the light received by said second photocell.

4,183,666

METHOD OF MEASURING LIGHT TRANSMISSION LOSSES OF OPTICAL MATERIALS

Yasuteru Tahara; Shunsuke Minami; Masaharu Oda, and Mikio Sera, all of Otake, Japan, assignors to Mitsubishi Rayon Company, Limited, Tokyo, Japan

Filed Mar. 10, 1977, Ser. No. 776,171
Int. Cl.[2] G01N *21/00*
U.S. Cl. 356—73.1 **5 Claims**



1. A method of measuring light transmission losses of optical material comprising the steps of:

providing an optical material whose light transmission loss is to be measured and which has scattering elements that cause a fraction of any light transmitted through the optical material to be radiated out of the optical material;

projecting light beams at two separate points alternately through a part of the optical material; and

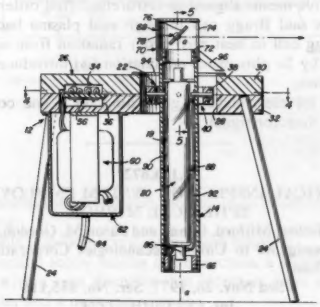
detecting the intensities of light radiated out of the optical mateiral at two separate points lying along the direction of transmission of said light beams in said part.

4,183,667

LIGHT-RAY INDICATOR

Howard M. Denton, 1338 N. Jim Miller Rd., Dallas, Tex. 75217

Filed Sep. 21, 1977, Ser. No. 835,444
Int. Cl.[2] G01C *5/02*
U.S. Cl. 356—250 **5 Claims**



5. A light-ray indicator comprising in combination:

a support including a tripod stand comprising a platform and three legs diverging from a common surface of the platform, the latter having in plan the shape of an isosceles triangle, and the legs being disposed at vertices of the triangle, with the platform having an opening receiving the housing, the platform including two superimposed sections each triangular in plan, each section provided with a recess mating with the recess of the other section for forming a void within the platform;

a housing;

mounting means attached to the support for removably supporting the housing on the support; and

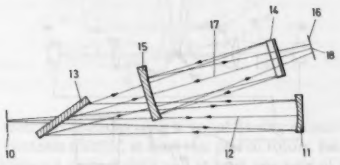
radiating means including a radiation source arranged within the housing for emitting a radiation beam from the housing, and further including a power supply partly disposed within the void formed within the platform.

4,183,668

METHOD OF ELIMINATING ASTIGMATISM AND COMA IN A SPECTROGRAPH INCLUDING A PLANE GRATING AND TWO CONCAVE, SPHERICAL MIRRORS

Peter Lindblom, Nagu, Finland, assignor to Applied Research Laboratories S.A., Ecublens, Switzerland

Filed Mar. 29, 1978, Ser. No. 891,337
Claims priority, application Sweden, Apr. 4, 1977, 7703880
Int. Cl.[2] G01J *3/40*
U.S. Cl. 356—305 **10 Claims**



1. A method of eliminating image aberrations, such as astigmatism and coma, in a spectrograph system, which includes an entrance slot, a plane diffraction grating, first and second concave, spherical mirrors and a focal plane characterized in selecting the reflection angles of said two mirrors, and the position of the entrance slot in relation to said first, concave mirror in such a manner, that the following mathematical conditions are simultaneously satisfied for at least one wavelength within the radiation expected to be received by the spectrograph system,

$$\frac{1}{r_1} = 2\left(1 - \frac{\cos^2\alpha}{\cos^2\beta}\right)^{-1}\left[\frac{\sin^2 b_a}{R_2 \cos b_a} + \frac{1}{R_1 \cos a}\left(1 - \cos^2 a \frac{\cos^2\alpha}{\cos^2\beta}\right)\right] \text{and}$$

$$\tan a = \left(\frac{R_1}{R_2}\right)^2 \sin b_c \cos b_c \frac{\cos^2\beta}{\cos^2\alpha},$$

in which the symbols have the following denominations:

r_1 denotes the distance between said entrance slot and a point at the reflecting surface of a first of the mirrors,

a denotes the angles between a central beam issuing from said entrance slot and impinging upon said first mirror at the point above referred to, and a normal to a tangent plane to said surface at said point,

R_1 denotes the radius of curvature for the reflecting surface of said first mirror,

α denotes the angle between a first beam impinging upon said plane grating and normal thereto at the point upon the grating surface where the beam impringes,

β denotes the angle between a second beam and said normal, after diffraction at said point upon said grating surface,

R_2 denotes the radius of curvature of the spherical surface of said second mirror,

b_a denotes the angle between a beam impinging upon said second mirror and a normal to a tangent plane to said second mirror surface, through the impinging point, and finally

b_c denotes the angle between an arbitrarily selected beam,

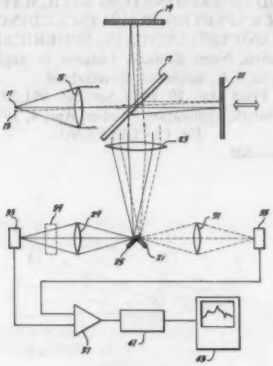
which impinges upon the surface of said second mirror, and a normal to a tangent plane to said second mirror surface, at the impining point.

4,183,669

DUAL BEAM FOURIER SPECTROMETER

Walter M. Doyle, Laguna Beach, Calif., assignor to Laser Precision Corporartion, Utica, N.Y.

Filed Sep. 6, 1977, Ser. No. 830,576
Int. Cl.[2] G01B *9/02*
U.S. Cl. 356—346 **21 Claims**



1. In a Fourier transform spectrometer which includes a Michelson-type interferometer having a beamsplitter which divides source radiation between a fixed-length path and a variable-length path, and having reflectors in each of those paths which reflect radiation back to the beamsplitter, the combination of:

radiation-propagating means for causing dual radiation beams to enter the interferometer on one side of the beamsplitter;

radiation-detecting means for separately detecting the dual radiation beams as they emerge from the other side of the beamsplitter;

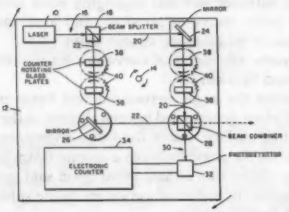
said dual radiation beams substantially overlapping one another at the beamsplitter and/or the reflectors.

4,183,670

INTERFEROMETER

Robert B. Russell, 288 Heath St., Chestnut Hill, Mass. 02167

Continuation-in-part of Ser. No. 853,033, Nov. 30, 1977, abandoned. This application Sep. 11, 1978, Ser. No. 941,047
Int. Cl.[2] G01B *9/02;* **G01P** *9/00*
U.S. Cl. 356—350 **5 Claims**



1. Apparatus for determining and measuring changes in the length of the effective light path between two fixed points on an enclosed light path, comprising:

a laser for generating a beam of coherent light;

means for projecting the beam into the enclosed light path;

means for splitting the beam and passing the split portions around the enclosed path in opposite directions;

means for combining the split portions at a common point in said path at which they first meet, to form at least one combined beam which is made up of a part of each split beam portion;

means for retarding the passage of light in at least one portion of the split beam;

means for periodically varying the amount of retardation brought about by said retardation means to produce a beat frequency in said combined beam; and

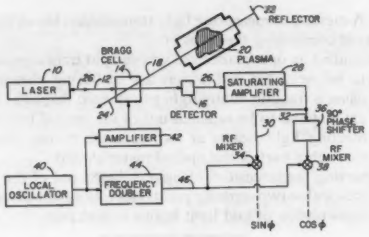
means for detecting and measuring the beat frequency of the combined beam at the time when the retardation is being varied.

4,183,671

INTERFEROMETER FOR THE MEASUREMENT OF PLASMA DENSITY

Abram R. Jacobson, Los Alamos, N. Mex., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Mar. 14, 1978, Ser. No. 886,377
Int. Cl.[2] G01B *9/02*
U.S. Cl. 356—354 **7 Claims**



1. An interferometer for generating signals representative of the density of a plasma comprising:

a source of laser radiation;

a Bragg cell aligned with said laser radiation and having a predetermined dirve frequency ν;

means for generating a detector signal;

reflective means aligned to retroreflect first order radiation from said Bragg cell through said plasma back to said Bragg cell to beat zero order radiation from said Bragg cell by 2ν plus phase modulation (ϕ) introduced by said plasma;

means for electronically generating sin ϕ and cos ϕ from said detector signal.

4,183,672

OPTICAL INSPECTION SYSTEM EMPLOYING SPHERICAL MIRROR

Peter E. Raber, Milford, Conn., and Jason M. Gordon, Katonah, N.Y., assignors to United Technologies Corporation, Hartford, Conn.

Filed Nov. 26, 1977, Ser. No. 855,116
Int. Cl.[2] G01B *11/24*
U.S. Cl. 356—376 **8 Claims**

1. An optical system for use with apparatus for contouring the surface of a test specimen, comprising:

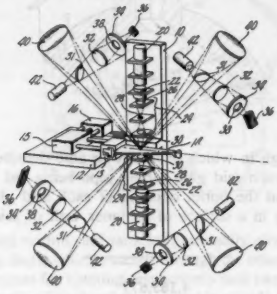
jig means for moving said test specimen in a plane;

source means for directing a beam of electromagnetic energy along an incident axis to the surface of said test specimen;

beam splitter means situated along a collecting axis, and oriented normal thereto, at least a portion of said collect-

ing axis being oblique to the plane in which the specimen is movable;

spherical mirror means disposed normal to said collecting axis, and situated at an optical distance from the surface of said test specimen such that it operates at approximately a one-to-one magnification ratio, for focusing electromagnetic energy impinging thereon; and



means disposed to receive electromagnetic energy from said spherical mirror for indicating the point relative to the plane of movement of the test specimen at which said beam of electromagnetic energy will intersect the surface of the test specimen.

4,183,673

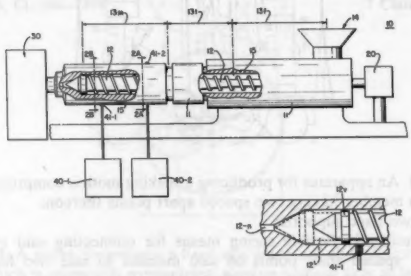
MARBLEIZATION OF PLASTIC MATERIALS

Wiley L. Easley, Lancaster; Richard J. Hoeske, Leominister, and Silvio Petrucci, Fitchburg, all of Mass., assignors to The Gillette Company, Boston, Mass.

Continuation of Ser. No. 660,006, Feb. 23, 1976, abandoned. This application Nov. 16, 1978, Ser. No. 961,402

Int. Cl.[2] B28C *7/04;* **B29B** *1/06*

U.S. Cl. 366—76 **10 Claims**



1. Apparatus for marbleizing molded parts comprising a housing;

a rotatable injection screw within said housing;

said injection screw having a feed section, a transition section with a root diameter that increases from said feed section, and a metering section;

means for applying plastic material to said feed section for conveyance in the direction of screw rotation towards the transition section which provides an increase in pressure and converts substantially the entire feed to molten condition in said metering section;

means for injecting colorant liquid into the melt where said screw contains only a primary flight;

means for directly coupling a mold to the output of said metering section which develops an increased level of pressure for the direct injection of molten plastic material with unmixed colorant into said mold; and

means for maintaining the fluidity of said melt.

4,183,674

MELT MIXER

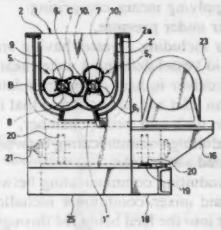
Sadayuki Sudo, and Takenaga Sudo, both of Tokyo, Japan, assignors to Nara Grinding Machinery Works, Ltd., Tokyo, Japan

Filed Dec. 2, 1977, Ser. No. 856,907

Claims priority, application Japan, Jul. 8, 1977, 52-90527

Int. Cl.[2] A21C *1/06;* **B28C** *1/16;* **B29B** *1/06;* **B01F** *7/02*

U.S. Cl. 366—91 **20 Claims**



1. A melt mixer comprising a vessel having means for heating the contents thereof, at least one pair of rotors, each of said rotors having a central shaft and at least one pair of diametrically opposed lobes of polygonal cross-section, said rotors being arranged within said vessel such that the respective lobes thereof are rotatable in overlapping circles of rotation lying in a common vertical plane, the lobes of one of said rotors in each said pair being angularly offset from the lobes of the other rotor in said pair and spaced from the adjacent wall of the vessel so that the area bounded by said lobes and the adjacent vessel wall decreases cyclically during rotation of said rotors and the contents of the vessel within said area are subjected to compressive forces and are urged into engagement with the said adjacent with the said adjacent wall of the vessel.

4,183,675

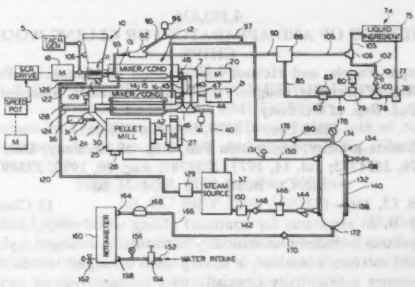
ENERGY CONSERVING METHOD AND APPARATUS FOR PELLETING PARTICULATE ANIMAL FEED

Albert I. Zarow, Mt. Pulaski, Ill., assignor to Feed Pelleting, Inc., Mt. Pulaski, Ill.

Filed Oct. 20, 1978, Ser. No. 953,220

Int. Cl.[2] B01F *15/06*

U.S. Cl. 366—144 **3 Claims**



1. In an animal feed pelleting mill including a feed pellet producing apparatus, a steam jacketed mixer/conditioner including means for feeding milled animal feed through same to said pellet producing apparatus and means for mixing the animal feed as it is fed through the mixer/conditioner, means

for supplying steam to the mixer/conditioner for heating the animal feed as it is fed therethrough, and means for supplying moisture to the feed being fed through the mixer/conditioner, the improvement wherein:

said steam supplying means comprises a steam system including a source of steam, supply conduiting for communicating live steam from said source to said mixer/conditioner, and return conduiting for returning condensation to the source of steam,

said system including means for isolating the feed from the steam and condensation of said system,

said system being in closed circuit relation for returning to the heat source the condensate created by the supplying of the steam to the mixer/conditioner,

said moisture supplying means comprising:

a source of water under pressure,

a heat exchanger including a vessel having an inlet and an outlet, with said vessel defining a water heating chamber, and a steam receiver in heat exchange relation with said vessel having an inlet and an outlet and that is free of fluid communication with said vessel chamber,

infeed water conduiting communicating between said source of water and said vessel inlet,

outfeed water conduiting communicating between said vessel inlet and said mixer/conditioner including means for inserting water into the feed being fed through the mixer/conditioner,

said vessel and said water conduiting forming a continuous flow water supply system and including flow control means for setting water flow therethrough at a predetermined rate,

said heat exchanger including steam infeed conduiting communicating live steam from said steam source and return conduiting for returning condensation in said heat exchanger to said steam source,

said heat exchanger steam infeed and condensate return conduiting and said receiver being in closed circuit relation for returning to the heat source the condensate created by the supplying of the steam to said heat exchanger receiver,

means for controlling the supply of steam through said steam system from said steam source to the mixer/conditioner to heat the feed being fed by the mixer/conditioner to the pellet producing apparatus to a predetermined temperature level above the temperature of the feed entering the mixer/conditioner,

and means for controlling the supply of steam to said heat exchanger receiver to heat the water passing from said heat exchanger vessel outlet to a predetermined temperature level free of boiling.

4,183,676

METHOD OF AND APPARATUS FOR GLUING WOOD CHIPS

Kaspar Engels, and Helmut Müller, both of Mannheim, Fed. Rep. of Germany, assignors to Draiswerke GmbH, Mannheim, Fed. Rep. of Germany

Filed Dec. 1, 1977, Ser. No. 856,847

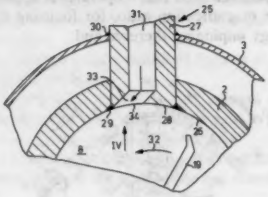
Claims priority, application Fed. Rep. of Germany, Dec. 3, 1976, 2654773; Jul. 14, 1977, 2731767; Aug. 30, 1977, 2738971

Int. Cl.[2] B01F *5/04, 7/04, 15/02*

U.S. Cl. 366—172 **13 Claims**

1. In an apparatus for continual gluing wood chips, which apparatus includes a substantially horizontally arranged, cylindrical mixture container, a mixing shaft arranged within the container substantially coaxially to a mixture ring of wood chips which is to be formed in the container, a mixture feed support at a first end of the mixture container and a mixture outlet support at a second end of the mixture container, and glue supply means including at least one glue supply pipe located on the mixture container, the pipe extending from outside into the mixture container and ending with its respective outlet opening in the mixture container, the improvement wherein

said glue supply means comprises means to feed glue under substantially zero pressure including an upwardly open



glue trough in which at least one glue distributing pipe empties, each said glue supply pipe being fed from said trough and the outlet opening of each said glue supply pipe lying in a surface of an inner wall of said mixture container.

4,183,677

MECHANISM FOR EFFECTING ORBITAL MOTION OF A MEMBER

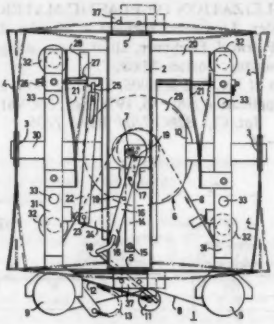
Norman A. de Bruyne, 3700 Brunswick Pike, Princeton, N.J. 08540

Filed Aug. 31, 1978, Ser. No. 938,707

Claims priority, application United Kingdom, Sep. 7, 1977, 37343/77

Int. Cl.[2] B01F *11/00*

U.S. Cl. 366—209 **16 Claims**



1. An apparatus for producing a shaking motion comprising:

a member having two spaced apart points thereon;

two fixed supports;

resiliently flexible spring means for connecting said two spaced apart points on said member to said two fixed supports so that a hypothetical line joining said two points on said member is transverse to and intersected by a hypothetical line joining said two fixed supports; and,

means connected to said member for effecting motion of said member.

4,183,678

AGITATING MIXING APPARATUS

Ietatsu Ohno, 1-2, 1-chome, Kasuya, Setagaya-ku, Tokyo, Japan

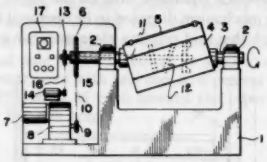
Continuation of Ser. No. 717,009, Aug. 23, 1976, abandoned. This application Dec. 16, 1977, Ser. No. 861,212

Int. Cl.[2] B01F *9/08*

U.S. Cl. 366—224 **1 Claim**

1. An agitating mixing apparatus comprising two rotary shafts separately rotatable independently of each other, one of which said rotary shafts extends through and is coaxial with

the other, and a hollow longitudinal tank adapted to hold various kinds of materials characterized by two opposite planar closed ends thereby defining said longitudinal tank having a body with corners at the meeting of said closed ends with a longitudinal container wall body, means affixed to said two closed ends mounting said tank at a fixed angle to one said rotary shaft to rotate therewith with all the tank corners gyrating about the shaft axis, agitation and mixing accelerating



blades fitted within said tank longitudinally along the one of said rotary shafts which extends through the other rotary shaft, separate means for rotating respectively said two rotary shafts independently of each other at variable speeds to affect rotation of said tank and said blades by said rotary shafts in a manner related to said mounting angle whereby the materials in said tank are caused to reciprocate diagonally about the blades in a figure 8 pattern.

4,183,679

MIXER, PARTICULARLY HEATING—COOLING MIXER FOR CHEMICAL PROCESSES

Hans Kimmel, Detmold, Fed. Rep. of Germany, assignor to Gunther Papenmeier KG Maschinen-und Apparatebau, Fed. Rep. of Germany

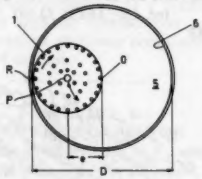
Filed May 23, 1975, Ser. No. 580,285

Claims priority, application Fed. Rep. of Germany, Jun. 11, 1974, 2428153

The portion of the term of this patent subsequent to Jan. 26, 1996, has been disclaimed.

Int. Cl.[2] B01F *7/14*

U.S. Cl. 366—288 **7 Claims**



1. A mixer comprising: a fixed mix container, the interior of which is essentially symmetrical about a vertical axis; at least one rotatably symmetrical mixing element having a plurality of mixing rods which are parallel to the axis of the mixing element, said mixing element axis being parallel to and laterally offset from the axis of the mixing container; carrier means; means rotatably mounting said mixing element on said carrier for rotation about said mixing element axis and means rotatably mounting said carrier means for rotation about the container axis; means for rotating said carrier means about the container axis to move the mixing element in a planet-like movement about the axis of the mixing container; and means, including said carrier means, for rotating the mixing element about its said axis as the carrier means rotates; the direction of rotation of the mixing element about the container axis being opposite to the direction of rotation of the element about its own axis, the angular velocities of the element corresponding to the relation $\omega_P = \omega_M$ where ω_P is the angular velocity of the element about the container axis and ω_M is the angular velocity of the element about the axis of the mixing element.

4,183,680

SCRAPER AND MIXER ELEMENT FOR ICE CREAM MAKING MACHINES

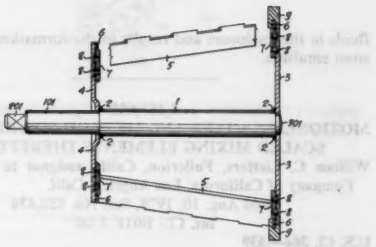
Ezio Manfroni, Sasso Marconi, Italy, assignor to Carpigiani Bruto Macchine Automatiche S.P.A., Anzola Emilia, Italy

Filed Jul. 21, 1978, Ser. No. 926,637

Claims priority, application Italy, Jul. 27, 1977, 15193/77[U]

Int. Cl.[2] B01F *7/20*

U.S. Cl. 366—312 **4 Claims**



1. In an ice cream making machine of the type comprising a cylindrical freezing barrel, a rotating scraper and mixer element formed by at least two scraping and mixing blades, each endwise secured to a pair of radial arms extending from a motor driven shaft rotatably supported axially inside of the said freezing barrel, with the said scraping the mixing blades into scraping engagement with the wall of the freezing barrel, the improvement according to which each scraping blade is fastened at both ends to a supporting plate, the said plates being secured to said radial arms in a radially adjustable manner said radial arms being provided at their ends with clamping means for firmly clamping said blade supporting plates at any adjusted position, and said clamping means comprising a substantially T shaped guiding block and screw means for tightly securing said guide block against the cooperating surface of the said radial arms; the said blade supporting plates being provided with longitudinal extensions inserted between the wings of the said guide block and the underlying surface of the said radial arms, so that by tightening the said screw means the said blade supporting plates are firmly clamped against the said radial arms.

4,183,681

EMULSION PREPARATION METHOD USING A PACKED TUBE EMULSIFIER

Norman N. Li, Edison, and Taras Hucal, Iselin, both of N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

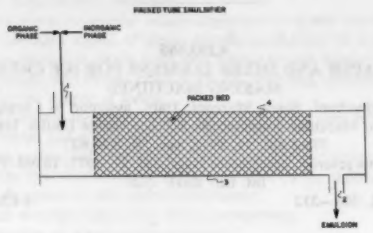
Filed May 19, 1978, Ser. No. 907,549

Int. Cl.[2] B01F *3/08, 5/00*

U.S. Cl. 366—336 **35 Claims**

1. A method for generating emulsions of immiscible fluids, which emulsions have an internal to external phase ratio from 1:1 to greater than 32:1 and a droplet size of from μ to greater than 50μ, which comprises simultaneously passing the immiscible fluids through an enclosure having at least one entrance orifice and at least one exit orifice thereby permitting the flow of said fluids through the enclosure along one of its axis from the entrance to the exit orifice, which enclosure is of any cross-sectional profile perpendicular to the axis of fluid flow,

which emclosure is packed with metal sponge which causes the rapid and repeated mixing and remixing of said immiscible



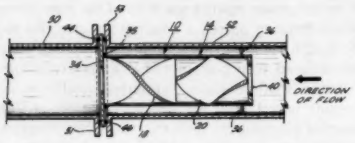
fluids in the enclosure and results in the formation of the desired emulsion.

4,183,682

MOTIONLESS MIXER AND METHOD FOR REMOVING SCALED MIXING ELEMENTS THEREFROM

William C. Lieffers, Fullerton, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Filed Aug. 10, 1978, Ser. No. 932,436
Int. Cl.[2] B01F *5/06*
U.S. Cl. 366—339 **5 Claims**



1. An in-line motionless mixer mounted in a fluid-conducting conduit, comprising:

a generally cylindrical, fluid-tight housing having a first end and an opposed second end and formed by two semi-cylindrical shells mated in abutting relationship thereby defining an axial pathway therethrough for conducting fluids, said shells being constructed of sheet metal;

a plurality of bands releasably tightened around said housing to maintain said housing fluid-tight;

at least one mixing element fixedly positioned within said axial pathway to mix the fluid flowing therethrough;

an annular flange releasably mounted at said first end of said housing, said annular flange being sized to secure said mixer in the conduit and to prevent axial removal of said mixing element through said first end of said housing;

a stop fixedly positioned within said housing and juxtaposed to said second end of said housing opposite said first end, said stop preventing axial removal of said mixing element from said second end of said housing; and

a plurality of radially extending rods mounted on the outer surface of said housing so as to center and stabilize said housing within said conduit.

4,183,683

LINE PRINTER FOR THE RAISED-DOT LANGUAGE OF BRAILLE CHARACTERS

Shoichi Hiratsuka, Narashino, and Hideki Arai, Tokyo, both of Japan, assignors to Tokyo Metropolitan Government, Tokyo, Japan

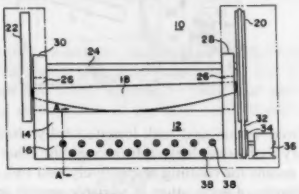
Filed Mar. 29, 1978, Ser. No. 891,225
Int. Cl.[2] B41J *3/32*
U.S. Cl. 400—122 **8 Claims**

1. A line printer for printing raised-dot language comprising:

(1) a base member having in an upper structure thereof a row of a plurality of printing pins, and means for biasing said pins so that heads of said pins protrude above a surface of said base member, and having in a lower structure thereof a plurality of latch pins and a plurality of solenoids energizable to protrude said latch pins into positions in which they prevent the printing pins from being depressed;

(2) a printing plate member for pressing a paper form against the heads of said plurality of printing pins arranged on said base member sequentially from one end to the other end thereof in the direction of arrangement of said printing pins so as to produce embossed dots on the paper form, and

(3) a driving mechanism disposed to be operated from a driving source such that said printing plate member is moved like a



cradle in the direction of arrangement of said printing pins, said driving mechanism comprises:

a pair of side wall plates attached to the sides of said base member and each having a vertical slit for guiding the sides of said printing plate member;

a pair of rotating disks fixedly mounted on a rotary shaft extended through said side plates, each of said rotating disks being provided in the inner surface thereof with an eccentric cam groove in such a manner that one of said eccentric cam grooves has a predetermined rotational angular difference with respect to the other; and

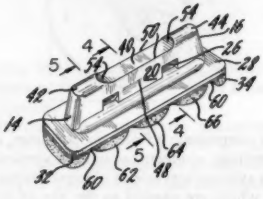
means for transmitting a rotary motion from said driving source to one of said pair of rotating disks.

4,183,684

FLUID DISPENSING UNIT

Carl F. Avery, Jr., Roscoe, Ill., assignor to Marion Health & Safety, Inc., Rockford, Ill.

Filed Nov. 29, 1977, Ser. No. 855,678
Int. Cl.[2] A61M *35/00*
U.S. Cl. 401—133 **9 Claims**



1. In a fluid dispensing unit comprising a shaped body structure having side walls, end walls, a top wall and a bottom opening defining a housing, there being a flange formed integral with the bottom of said side and end walls and encircling said opening,

a porous pad member covering said opening and in sealed connection with said flange member, and

an elongated frangible ampoule containing fluid carried in said housing and extending longitudinally thereof between said side walls, the body structure being of sufficiently flexible material to permit digitally applied squeezing together of said side walls to fracture said ampoule and release the fluid therein for transmission of same to and

through said porous pad member, the improvement wherein

said housing top wall has a central planar segment thereof stepped down relative to terminal segments of said top wall and merging with substantially right angularly disposed generally planar portions of said housing side walls to define an inverted housing channel structure of enhanced rigidity embracing said ampoule, the central segment of said top wall and right angularly disposed portions of said side walls intersecting at sharp corner juncture to provide fulcrum points whereby during the squeezing together of said side walls for fracturing said ampoule, upward bulging of said central segment is prevented, and side wall movement at least along lengths thereof coextensive with said top wall central segment is limited to pivoting of each toward the other about the respective fulcrum point.

4,183,685

INK

Hans J. Hofmann, and Axel Jankewitz, both of Nuremberg, Fed. Rep. of Germany, assignors to Schwanhausser & Co. Schwan-Bleistift Fabrik, Nuremberg, Fed. Rep. of Germany

Division of Ser. No. 666,900, Mar. 15, 1976, Pat. No. 4,097,289. This application Oct. 6, 1977, Ser. No. 839,833

Int. Cl.[2] B43K *5/00*

U.S. Cl. 401—202 **4 Claims**

1. A writing instrument for producing writing or markings which can be easily wiped off, comprising:

a housing formed with an ink reservoir and a stylus, said stylus having capillary properties and being in fluid communication with said ink reservoir, and

an ink, said ink comprising a readily volatile organic solvent, an ink binder selected from the group consisting of a natural resin, a synthetic resin and a cellulose derivative, a dyestuff distributed in said binder, and an ester compound of the general formula:

$$R_1-\overset{\overset{O}{\|}}{C}-O-R_2$$

wherein one of R_1 and R_2 is a saturated aliphatic hydrocarbon radical having 10 to 22 carbon atoms and the other of which is selected from the group consisting of a cyclopentyl, cyclohexyl and saturated aliphatic hydrocarbon radicals having from 2 to 22 carbon atoms, said ester compound comprising 2 to 20% by weight of said ink.

4,183,686

DEAD END CONNECTOR

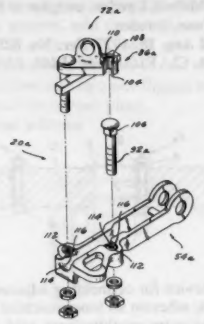
Robert V. De France, Poughkeepsie, N.Y., assignor to Fargo Manufacturing Company, Inc., Poughkeepsie, N.Y.

Filed Jan. 5, 1978, Ser. No. 867,168

Int. Cl.[2] H02G *15/00*

U.S. Cl. 403—11 **5 Claims**

5. A dead end connector for a transmission cable comprising; an elongated body, a cable-receiving longitudinal channel formed in said body, a pressure pad, an elongated base portion on said pressure pad adapted to be aligned with the longitudinal channel of the body, a cross piece on the side of the base portion opposite to the side adjacent the channel of the body when aligned therewith, the cross piece extending across and outwardly from both sides of the aligned body and pad at an oblique angle with respect thereto, coupling means for retaining the pressure pad in overlying aligned position with respect to the channel to hold a portion of a transmission cable therein with the cross piece enabling the provision of a holding pressure along at least a substantial portion of the engagement surface of the pressure pad with the transmission cable portion, and partial release means being provided on said crosspiece for permitting partial release of a first part of the coupling means in a manner which permits the pressure pad to be pivoted on the second part thereof and swung away from said partially released first part and from alignment with the channels in the



body to expose the longitudinal channel without the necessity of complete disassembly of the pressure pad from the body.

4,183,687

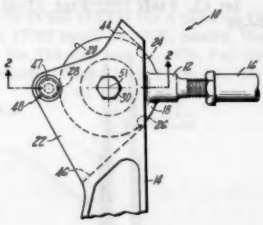
PIVOTAL JOINT WITH REDUNDANT CONNECTING MEANS BETWEEN THE TWO PIVOTALLY JOINED PARTS THEREOF

Frank Bramwell, Hamden, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Jun. 15, 1978, Ser. No. 916,332

Int. Cl.[2] F16C *11/00*

U.S. Cl. 403—11 **8 Claims**



1. A pivotal joint comprising:

(A) a first member having a wheel-shaped end;

(B) a second member having a forked end enveloping at least a portion of the wheel-shaped end of the first member;

(C) a primary pivot bolt connection extending through said first and second members in selected position so as to pivotally join the first and second members for relative pivotal motion therebetween, and

(D) second means for pivotally connecting said first and second members comprising:

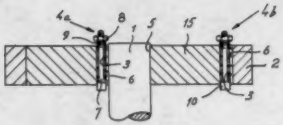
(1) at least three contact surfaces located on the forked end of said second member and selectively positioned to envelop said wheel-shaped end of said first member to present contact surfaces to engage and cooperate with the circumferential periphery of the wheel-shaped end of said first member to pivotally connect said first and second members should said primary pivot bolt connection become inoperative.

4,183,688

EXPANSIBLE SLEEVE DEFORMS HUB BORE AGAINST SHAFT

Inge B. Persson, Malmö, Sweden, assignor to Forenade Fabriksverken, Eskilstuna, Sweden

Filed Aug. 18, 1977, Ser. No. 825,785
Int. Cl.[2] F16D *3/80*; F16L *17/00*
U.S. Cl. 403—31 **12 Claims**



1. A coupling device for connecting adjacent machine parts and like structures, wherein an inner machine part is enclosed within at least one outer machine part; said coupling device comprising at least one bore hole extending partially or completely through one of said machine parts and a pressure sleeve of deformable material disposed within said bore hole; said bore hole disposed adjacent to the interface between and nonconcentric with said inner and outer machine parts; said pressure sleeve contacted by screw means which provides axial compression and radial deformation to said pressure sleeve, whereby said radial deformation of said pressure sleeve causes a corresponding radial deformation of a portion of one of said machine parts at said interface of said adjacent machine part.

4,183,689

COLUMN OF TELESCOPICALLY ADJUSTABLE LENGTH

Winfried Wirges, and Egon Sentinger, both of Koblenz, Fed. Rep. of Germany, assignors to Stabilus GmbH, Koblenz-Neuendorf, Fed. Rep. of Germany

Filed Jun. 26, 1978, Ser. No. 918,847
Claims priority, application Fed. Rep. of Germany, Jul. 20, 1977, 7722659[U]
Int. Cl.[2] F16D *3/80*; F16L *17/00*
U.S. Cl. 403—31 **12 Claims**

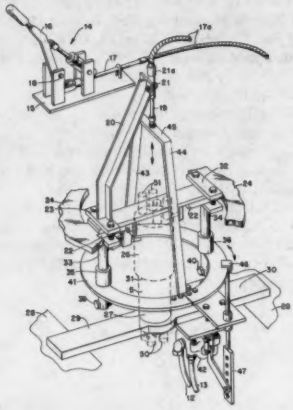
1. A column of telescopically adjustable length comprising:
(a) an outer, elongated, tubular member bounding a longitudinal bore of polygonal cross section;
(b) an inner, elongated member of substantially circular cross section having a longitudinal portion received in said bore for longitudinal movement relative to said outer member, said portion being formed with a plurality of recesses open toward said outer member;
(c) a plurality of guide elements partly received in said recesses respectively and substantially secured against longitudinal movement relative to said inner member by engagement with said inner member, said elements engaging said outer member in respective corners of said polygonal cross section and thereby preventing relative angular displacement of said members about a longitudinal axis; and
(d) manually operable arresting means for arresting said movement in a multiplicity of relative longitudinal positions of said members.

4,183,690

APPARATUS FOR COUPLING A ROTATABLE CONTROL DEVICE TO A STATIONARY SWITCH

Richard B. Moery, and Wayne J. Roberson, both of Asheville, N.C., assignors to Farm Equipment Company, Inc., Asheville, N.C.

Filed Jan. 8, 1979, Ser. No. 1,383
Int. Cl.[2] F16C *11/00*; F16G *11/12*
U.S. Cl. 403—59 **11 Claims**



1. An apparatus for coupling a rotatable control means to a stationary switch comprising:
a table adapted to freely rotate about an axis;
said control means connected to said table;
a stationary support coupled to said table through a swivel;
said table supported by said stationary support;
a plate coupled to said control means and adapted to move in response to said control means;
a bracket connected to said stationary switch means;
said bracket connected to said stationary switch means to drive said stationary switch means between a first position and a second position;
said bracket located in a sufficiently close proximity with said plate so as to engage said plate in response to said control means, thus moving said switch between said first position and said second position in response to said control means.

4,183,691

LOCKING ELEMENT

Leonard Van Melle, Emst, Netherlands, assignor to Industries - En Handelsonderneming Bijstede B.V., Nunspeet, Netherlands

Filed Apr. 11, 1978, Ser. No. 895,486
Int. Cl.[2] F16B *21/14*
U.S. Cl. 403—109 **1 Claim**

1. A locking element for securing two interfitting cylindric portions against shifting, each said portion being provided with an aperture in the circumference, said locking element com-

prising a pin with a pre-biased resilient element connected therewith which, when said pin is disposed within the said apertures, encloses the two cylindric portions at least partially, the resilient element having such a length that, when the pin is withdrawn from the said apertures, the free end of the resilient element rests on the outer wall of the outermost cylindric

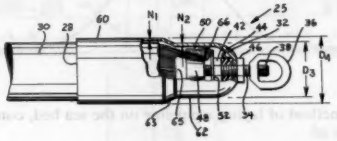
portion enclosing said outermost portion over a sufficient distance, so as to prevent the locking element from being detached unintentionally, and said resilient element is a curved flat plate spring having an elongated recess in its free end, the width of said recess being at least equal to the diameter of the pin.

4,183,692

CABLE PULLING EYE

Helmut E. Durr, Dunwoody, Ga., assignor to Western Electric Company, Incorporated, New York, N.Y.

Filed Oct. 2, 1978, Ser. No. 947,926
Int. Cl.[2] F16G *11/05*
U.S. Cl. 403—275 **2 Claims**



1. A cable pulling eye comprising a tubular shell having a rounded nose end that defines an opening through which a bolt extends and to which an eye is mounted and an open tail end through which the end of a generally cylindrical cable may be inserted and housed for cable drawing operations through a duct, and with said shell having a cylindrical tail section adjacent said open tail end of a substantially uniform outside diameter which unitarilly joins a cylindrical nose section adjacent said nose end of reduced outside diameter, and with said shell nose section having a relatively thick shell wall and said shell tail section having a relatively thin shell wall whereby the shell tail section may be swaged into gripping engagement with a cable housed therein without increasing the outside diameter of the shell, and a cable anchor block mounted to said bolt within said shell nose section and a ring positioned about said anchor block through which an annular array of cable wires may be extended in mechanically coupling the cable with the bolt and eye.

4,183,693

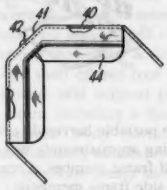
CORNER PIECE FOR A DOUBLE GLAZED WINDOW CONSTRUCTION

Gunter H. Berdan, Toronto, Canada, assignor to Custom Roll-forming Company Limited, Ontario, Canada

Filed Apr. 4, 1978, Ser. No. 893,404
Int. Cl.[2] E04C *2/38*
U.S. Cl. 403—295 **18 Claims**

1. In a corner piece for connecting the ends of two adjacent spacers in a hermetically sealed double glazed window, each said spacer being formed of a metal strip bent into a hollow elongated form with adjacent edges of the strip forming a joint which projects into the hollow interior of the spacer, the joint including one edge portion of the strip bent to form an outwardly facing groove and another edge portion of the strip bent to form an inwardly extending lip which lip fits into said outwardly facing groove, said corner piece having two arms extending at 90° to each other, each arm being suitable for fitting into an adjacent end portion of one of said spacers and each arm having a base and two side flanges such that the bases form the outside of the corner piece,

the improvement wherein



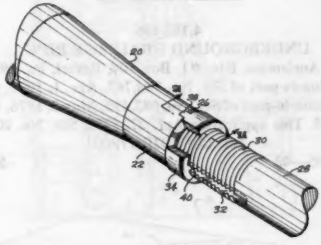
each of said bases has a respective inwardly angled extension, each extension being formed integrally with its associated base and having an outer edge portion extending transversely relative to its associated arm, each extension having a narrow slot-like recess formed in its outer edge portion, said recess of each extension being suitable for receiving and embracing the sides of said one edge portion of the spacer strip which forms the groove so that the sides of said recess prevent spreading of the spacer joint when an arm of the corner piece is inserted into the end portion of a spacer.

4,183,694

COMBINATION TUBE FIXED TO A SHANK OR NIPPLE

Robert K. Dent, 17765 Beach Dr., NE., Seattle, Wash. 98155

Division of Ser. No. 714,600, Aug. 16, 1976, Pat. No. 4,114,250.
This application May 22, 1978, Ser. No. 908,404
Int. Cl.[2] F16B *29/00*
U.S. Cl. 403—320 **9 Claims**



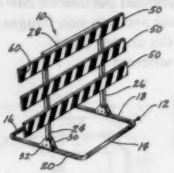
1. A combination swaged joined tube and an externally threaded steel member comprising an aluminum tube having an end wall having slots in said end wall, and having an internally threaded bore threadedly receiving therein an externally threaded steel member; and an aluminum sleeve being disposed on the externally threaded member and adjacent the end wall of the tube and being cold pressed to provide for flow of aluminum from said sleeve into the slots in the end wall of the tube, and into the internal threads of the bore of said tube and into the threads of said externally threaded member.

4,183,695

COLLAPSIBLE BARRICADE

Ernest J. Wilcox, 411½ E. Main St., Montezuma, Iowa 50171

Filed Aug. 30, 1978, Ser. No. 938,065
Int. Cl.[2] E01F *13/00*
U.S. Cl. 404—6 5 Claims



1. A collapsible portable barricade comprising:

a base frame lying approximately in a single plane and having a forward frame member, a rearward frame member and opposite side frame members;

each of said side frame members having a bracket attached thereto intermediate the opposite ends thereof;

a pair of leg members having upper and lower ends;

at least one display cross member extending transversely of and interconnecting said leg members;

hinge means including a pivot pin connecting each of said leg members to one of said brackets adjacent said lower ends of said leg members for pivotal movement about a horizontal hinge axis, said legs being pivotal approximately 180° from a first horizontal position to a vertical position to a second horizontal position,

said legs having locking holes extending therethrough and located in spaced relation to said hinge axis,

said brackets each having a first hole, a second hole and a third hole positioned to register with said locking holes when said leg members are in said first horizontal position, said vertical position and said second horizontal position, respectively,

a shear pin extending through said locking holes and one of said first, second and third holes, said shear pin being removable to permit movement of said leg members between said first horizontal, vertical and second horizontal positions, and

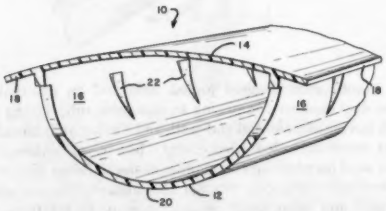
said shear pin being adapted to shear in response to a predetermined impact force being directed to said leg, so that said legs will pivot to one of said horizontal positions in response to said impact force.

4,183,696

UNDERGROUND DRAINAGE PIPE

Robert S. Auriemma, Rte. #1, Box 104, Bethel, Pa. 19507

Continuation-in-part of Ser. No. 783,767, Apr. 1, 1977, which is a continuation-in-part of Ser. No. 682,492, May 3, 1976, Pat. No. 4,065,925. This application Apr. 27, 1978, Ser. No. 900,509
Int. Cl.[2] E02B *11/00*
U.S. Cl. 405—43 5 Claims



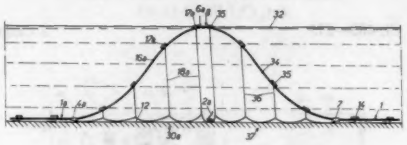
1. A drainage pipe adapted to be buried underground and having improved drainage and strength characteristics, said pipe formed of a length of extruded stiffly flexible plastic including a generally U-shaped trough opening upwardly with lips at the upper trough edges; a roof overlying the trough and integrally joining the trough at the top of the lips, a series of generally triangular drainage openings formed at regular intervals through the thickness of each lip, each opening having a pair of long sides extending along the outer surface of the trough to a point of intersection away from the lip and a short side extending along the length of the pipe and joining the upper ends of the long sides adjacent the upper trough edge, said long sides intersecting at an acute angle whereby upon burial of the pipe in pebbly soil the soil filling around the trough may partially but not completely block said openings, the thickness of said lips increasing smoothly from the bottom of the drainage openings to the roof to strengthen the trough and compensate for loss of strength due to the drainage openings.

4,183,697

LAYING OF UNDERWATER PIPELINES

Jacques E. Lamy, Fontenay-aux-Roses, France, assignor to Compagnie Generale pour les Developpements Operationnels des Richesses Sous-Marines "C.G. DORIS", Paris, France

Division of Ser. No. 757,098, Jan. 5, 1977, Pat. No. 4,096,705. This application Mar. 2, 1978, Ser. No. 882,747
Claims priority, application France, Jan. 27, 1976, 76 02135
Int. Cl.[2] F16L *1/04*
U.S. Cl. 405—170 5 Claims



1. A method of laying a pipeline on the sea bed, comprising the steps of:

(a) towing a first pipeline section from a shore towards the open sea while maintaining a front end portion of the first pipeline section near the surface of the sea,

(b) preparing a second pipeline section ashore and towing the second pipeline section towards the open sea past the first pipeline section, while maintaining front and rear end portions of the second pipeline section near the surface of the sea and supporting a length of the second pipeline section intermediate said end portions on the sea bed,

(c) joining the rear end of the second pipeline section to the front end of the first pipeline section, and

(d) allowing the joined ends to descend to the sea bed.

4,183,698

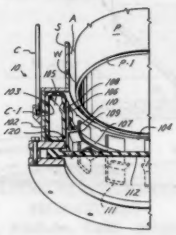
WIPER, GROUTING SEAL AND DIAPHRAGM APPARATUS

Malcolm G. Coone, Houston, Tex., assignor to Lynes, Inc., Houston, Tex.

Filed Sep. 15, 1978, Ser. No. 942,527
Int. Cl.[2] E02D *5/14*
U.S. Cl. 405—227 19 Claims

1. A combination wiper, grouting seal and diaphragm apparatus for use on a tubular sleeve of a structure, a piling being receivable through said sleeve, said apparatus comprising: a cylindrical housing defining a bore therethrough; an elastomeric manifold seal extending interiorally within and circumferentially around said housing; fluid receiving means through said manifold for communication with a pressure conduit extendable from said manifold to said structure; fluid ejecting means through said manifold for selective discharge of fluid injectable through said conduit and said manifold and interior

of said sleeve; a longitudinally shiftable cage member initially defining the interior wall of said housing; means on said cage member engageable by the lower end of said piling insertable within said sleeve for longitudinally shifting said cage member whereby said manifold may be urged away from said housing



and against said piling; and diaphragm seal means initially held by said housing and defined across said bore, said seal means being rupturable by said cage member upon longitudinal shifting of said cage member by said piling to wipe the exterior of said piling.

4,183,699

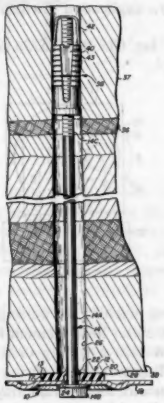
WASHER/GASKET FOR MINE ROOF BOLT ASSEMBLY

David C. Donan, Jr., R.R. #1, - Rainwatee La., Manitou, Ky. 42436, and David M. Donan, 1601 N. Leverett, Fayetteville, Ark. 72701

Filed May 18, 1978, Ser. No. 907,112

Int. Cl.[2] E21D *21/00*

U.S. Cl. 405—259 **6 Claims**



1. A mine roof bolt assembly for supporting a mine roof, said mine roof bolt assembly comprising in combination:

(a) a roof bolt having a shaft;

(b) support plate means engaged by said roof bolt for applying supporting force against a portion of said mine roof;

(c) expansion means engaging an upper end of said mine roof bolt for expanding against an interior wall of a roof bolt hole to anchor said mine roof bolt assembly; and

(d) flexible washer means disposed around a shaft of said roof bolt between said support plate means and said mine roof for sealing said mine roof to said support plate means to prevent ambient mine air from entering into said roof bolt hole while said mine roof bolt assembly remains installed in said mine roof, thereby preventing degrading of layers of strata above said mine roof by said ambient mine air, said washer means including a substantially annular body portion and a sphincter means extending inwardly from said body portion against said shaft, said substantially annular body portion having a pair of opposed substantially parallel surfaces, one for engaging said support plate means and one for engaging said mine roof, said annular sphincter means being substantially coplanar with said substantially annular body portion, flexible and extending inwardly from said body toward the roof bolt shaft to increase the pressure of said sphincter means against said shaft of said roof bolt in response to compressing of said substantially annular body portion of said washer means between said support means and said mine roof around said roof bolt hole as said roof bolt is tightened, thereby increasing the sealing action of said sphincter means against said shaft of said roof bolt as said roof bolt is tightened against said support plate means, said annular sphincter means including a flange thinner than said substantially annular body portion extending inwardly from said substantially annular body portion, said substantially annular sphincter means having a center hole having a diameter less than the diameter of said roof bolt shaft, said substantially annular body portion having an inside diameter which is substantially greater than the diameter of said roof bolt shaft.

4,183,700

WALKING MINE SUPPORT

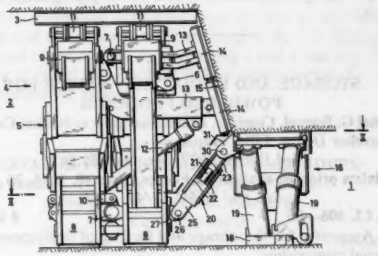
Gerhard von Klinggräff, Neukirchen-Vluyn; Karlheinz Bohnes, Bochum; Heinz Kunzer, Herne, and Peter Marr, Bochum, all of Fed. Rep. of Germany, assignors to Bochumer Eisenhutte Heintzmann GmbH, Bochum, Fed. Rep. of Germany

Filed Oct. 4, 1978, Ser. No. 948,324

Claims priority, application Fed. Rep. of Germany, Oct. 8, 1977, 2745429

Int. Cl.[2] E21D *15/44*

U.S. Cl. 405—291 **8 Claims**

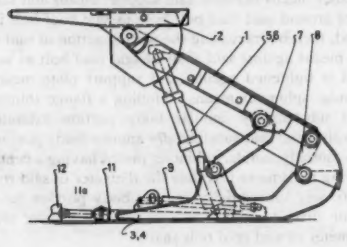


1. A walking mine support for supporting the overburden in the area where a roadway and a face gallery merge with one another, comprising a walking roadway support unit adapted to support at least the roof of the roadway and adapted to advance lengthwise of the latter; a walking face gallery support unit adapted to support the roof of the face gallery and also adapted to advance lengthwise of the roadway; and at least one four-pivot coupling connecting said units with one another and comprising coupling members which are tiltable about mutually inclined axes extending lengthwise of and transverse to the elongation of the roadway, respectively.

4,183,701
COUPLING GEAR FOR LEMNISCATE SHIELD TIMBERING FRAME

Harry Oppenlander, Wetter, and Peter Naundorf, Duisburg, both of Fed. Rep. of Germany, assignors to Thyssen Industrie AG, Fed. Rep. of Germany

Filed Oct. 13, 1978, Ser. No. 951,039
Claims priority, application Fed. Rep. of Germany, Oct. 13, 1977, 2746031
Int. Cl.[2] E21D *15/44*
U.S. Cl. 405—295 5 Claims



1. A coupling gear for connecting two side-by-side longitudinally extending shiftable skids of a divided footwall skid of a lemniscate shield timbering frame for actuation by a fluid pressure operated piston and cylinder combination which is adapted to be connected thereto, comprising, a double crank joint including a first and a second outer crank pin extending transversely between the skids, bracket means adapted to be positioned on the respective skids for rotatably supporting said outer crank pins on the respective skids, said first and second outer crank pins having outer ends rotatably supported in said bracket means and having opposite inner ends, first and second longitudinally extending, substantially parallel crank arms, said first crank arm having a first end non-rotatably connected to said inner end of said first outer crank pin and having an opposite second end, said second crank arm having a first end freely rotatable on said second outer crank pin and having an opposite second end, a central crank pin having a first end freely rotatable in said first crank arm opposite end and non-rotatably connected to said second crank arm opposite end, one of said crank pins being extended inwardly of its associated crank arm and providing a connection to said piston and cylinder combination.

4,183,702
STORAGE AND EXTRACTION DEVICE FOR POWDERED PRODUCTS

Michel G. Bonnel, Comines, France, assignor to Societe Colmant Cuvelier Dodge, Lille, France

Filed Dec. 9, 1977, Ser. No. 859,262
Claims priority, application France, Dec. 10, 1976, 76 37242
Int. Cl.[2] B65G *53/48, 3/14*
U.S. Cl. 406—56 8 Claims

1. Apparatus for the storage and feeding of finely powdered material comprising:

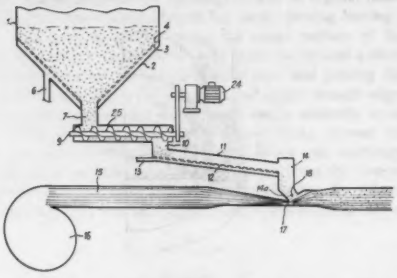
a silo for containing said material, means for fluidizing said material in the silo,

proportioning means for extracting said material from said silo,

an elongated tunnel having a porous partition defining first and second chambers, said partition selectively allowing passage of gas within said first chamber to fluidize said material received in said second chamber from an outlet of said proportioning means, said tunnel extending at a downward incline from the horizontal so that said received material fluidizes and flows down said incline substantially as a fluid, the slope and length of said incline such that said material exits said tunnel as a substantially uniform composition, and

venturi means at the outlet of said tunnel including

a hopper for receiving material from said tunnel,



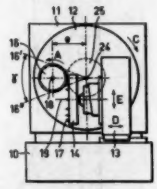
a venturi receiving material from said hopper, said hopper obliquely intersecting and discharging into the downstream portion of said venturi at an incline corresponding to the direction of flow in said venturi, said incline substantially eliminating depression turbulence, and

means supplying gas to said venturi.

4,183,703
APPARATUS FOR MANUFACTURING PAIRS OF SPUR GEARS

Erich Kotthaus, Wallisellen, Switzerland, assignor to Werkzeugmaschinenfabrik Oerlikon-Buhrle AG, Zurich, Switzerland

Filed Oct. 4, 1976, Ser. No. 729,351
Claims priority, application Switzerland, Oct. 24, 1975, 13770/75
Int. Cl.[2] B23F *5/26, 9/14*
U.S. Cl. 409—25 8 Claims



1. A gear cutting machine for cutting a spur gear element, comprising an end cutter head element for cutting a spur gear element having an axis, a rolling cradle for carrying out a predetermined rolling movement during machining of the spur gear and having an axis, means mounting one of said elements at said rolling cradle, the end cutter head element having an axis arranged substantially perpendicular to the axis of the rolling cradle and the spur gear element having its axis arranged substantially parallel to the rolling cradle axis, means for mounting at least one of both elements to be displaceable perpendicular to the axis of the rolling cradle, and means including the rolling cradle for mounting the other element to be pivotable relative to said one element.

5. A gear cutting machine for cutting a first spur gear element wherein the teeth thereof have an involute-shaped profile and a second spur gear element meshing with the first spur gear element, the second spur gear element having a straight tooth depth profile, comprising an end cutter head element for cutting a spur gear element having an axis, a rolling cradle rolling a determined angle during machining of the spur gear element and having an axis, means mounting one of said elements at said rolling cradle, the end cutter head element having

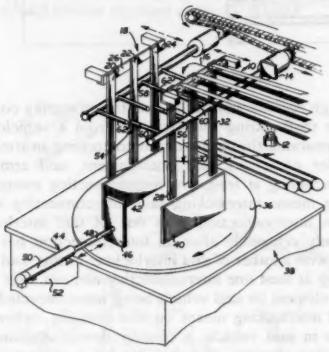
an axis arranged essentially perpendicular to the axis of the rolling cradle and the gear element having its axis arranged essentially parallel to the rolling cradle axis, means for mounting at least one of both said elements to be displaceable perpendicular to the axis of the rolling cradle, and means including the rolling cradle for mounting the other element to be pivotable relative to the other element.

4,183,704

COMPENSATING STACKER FOR PRINTED SIGNATURES

Horst K. Steinhart, Anaheim, Calif., assignor to Rima Enterprises, Santa Ana, Calif.

Continuation of Ser. No. 736,843, Oct. 29, 1976, abandoned.
This application Apr. 17, 1978, Ser. No. 896,742
Int. Cl.[2] B65H *29/34*
U.S. Cl. 414—31 **7 Claims**



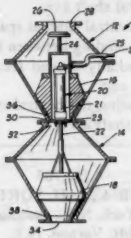
1. In a compensating stacker for vertically stacking a plurality of signatures having one edge thicker than the remaining edges thereof and compensating for said increased thickness by offsetting successive pile portions by 180°, the improvement which comprises, a vertically disposed dimensionally adjustable stacking frame, a temporary platform for temporarily supporting a plurality of signatures in a pile portion within said stacking frame, said temporary platform including parallel first and second shafts lying in a common horizontal plane, a plurality of fingers extending from each of said shafts toward the other shaft from a single longitudinal element along said shaft and defining a temporary platform for receiving signatures successively and temporarily holding said signatures to form a pile portion having a predetermined number of signatures therein, means for adjusting the space between said first and second shafts, and means responsive to said predetermined number for drivingly rotating said shafts in opposite directions through 360° to drop said pile portion in said stacking frame and re-establish said temporary platform in time relation for receiving the first of the next pile portion of signatures from said signature conveyor, clutch means coacting between each of said shafts and said means for drivingly rotating said shafts and operative to effect 360° rotation of said shafts, means for actuating said clutch means in response to said predetermined number of signatures, and means for disengaging said clutch means after 360° of rotation of said shafts in said opposite directions.

4,183,705

RECIPROCATING AIRLOCK VALVE

John E. Kice, Wichita, Kans., assignor to K-B Engineering Co., Wichita, Kans.

Filed Jan. 16, 1978, Ser. No. 869,530
Int. Cl.[2] F27B *3/18*
U.S. Cl. 414—221 **4 Claims**



1. A reciprocating airlock valve used in transferring of granular and powdered stock between two operations and maintaining a pressure differential therebetween, the valve comprising:

an upper hopper having a first inlet port for receiving stock therein and a first outlet port for discharging the stock therethrough;

a lower hopper attached to the bottom of said upper hopper and having a second inlet port indexed with the first outlet port of said upper hopper for receiving the stock from said upper hopper, and a second outlet port for discharging the stock therefrom;

a first plug disposed inside said upper hopper, the lower portion of said first plug received in the first outlet port for providing a seal;

a second plug disposed inside said lower hopper, the lower portion of said second plug received in the second outlet port of said lower hopper and providing a seal;

reciprocating means disposed inside said upper plug and connected to said lower plug for raising and lowering said first plug and said second plug in said upper hopper and said lower hopper, said reciprocating means comprising a fluid operated motor having a fluid cylinder with a fluid operated cylinder rod extending therefrom having means connecting same in operating relation to said first and said second plug; and

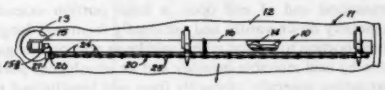
a stopper extending upwardly from the top of said upper plug and dimensioned to be received in the first inlet port of said upper hopper and providing a seal when said first plug is raised and lowered in said upper hopper by said reciprocating means.

4,183,706

AGITATOR FOR STORAGE BIN UNLOADERS

William Jackson, P.O. Box 444, Nye, Mont. 59061

Filed Jan. 26, 1979, Ser. No. 6,764
Int. Cl.[2] B65G *65/70*
U.S. Cl. 414—311 **7 Claims**



1. An agitator for particulate material unloading devices that include an auger assembly extending radially from a central outlet sump of a circular bin with the auger being powered to pivot in a forward direction about a vertical axis along the floor of the bin and with auger drive means for rotating the

auger assemblies about a radial auger axis to engage and move particulate material toward the central outlet sump, the agitator comprising:

bracket means adapted to be mounted to the auger assembly and projecting forwardly therefrom;

bearing means on the bracket means;

a central shaft adapted to extend along the length of the auger assembly journalled in the bracket means for rotation about a central shaft axis;

discs affixed to the central shaft at spaced intervals thereon;

axial agitator bars extending between the discs and mounted to the discs at radially spaced locations relative to the central shaft axis; and

drive means for rotating the central shaft and agitator bars about the central shaft axis.

4,183,707

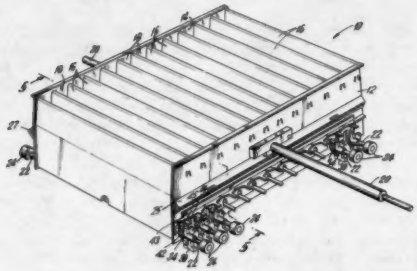
DOOR FOR A MAIL SORTING BIN

Andrew D'Aloia, New York, N.Y., assignor to American Technical Industries, Inc., Mt. Vernon, N.Y.

Filed Mar. 15, 1978, Ser. No. 886,799

Int. Cl.[2] B65B *21/02*; B65G *43/00*

U.S. Cl. 414—414 **13 Claims**



1. An improved door for a mail transporting bin said bin having first and second longitudinal side walls; a plurality of transverse partitions disposed between said side walls to define a plurality of parallel vertical mail holding slots; each said slot being open at its top end, and closable at its bottom end by one of a plurality of doors; each of said doors being an elongated substantially rectangular member having first and second transverse ends adjacent respectively to said longitudinal side walls of said bin and an upper and a lower longitudinal edges which are substantially perpendicular to the side walls of said bin; and being pivotably mounted between the side walls of said bin about an axis adjacent to and extending along said upper longitudinal edge of said door; bias means to urge each of said doors toward an open position and a movable member arranged to hold each of said doors in a normally closed position, said improved door being formed of a resilient sound damping material and including;

a trip lever integrally formed with said door, said trip lever being substantially coplanar with said door and having a longitudinal portion extending outwardly from said first transverse end of said door, a lever portion extending generally downwardly and outwardly from said longitudinal portion to a point where said lever portion is engageable by said movable member and an attachment portion extending generally upwardly from said longitudinal portion to a point approximately even with said upper longitudinal edge of said door, said attachment portion being spaced from said first transverse end of said door to define an aperture therebetween; and

means to pivotably attach said door between said longitudinal sides of said bin such that one longitudinal side of said bin extends through said aperture defined by said trip lever and said first transverse end of said door.

4,183,708

HIGH SECURITY SYSTEMS FOR PROTECTING VALUABLE OR DANGEROUS CONSIGNMENTS FROM THEFT

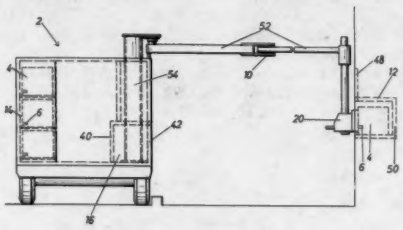
Manfred Kuhbier, Düsseldorf, and Sigrid Kuhbier, Rüsselsheim, both of Fed. Rep. of Germany, assignors to Ingenieurgesellschaft Kuhbier KG, Karst, Fed. Rep. of Germany

Filed Mar. 16, 1978, Ser. No. 887,255

Claims priority, application Fed. Rep. of Germany, Mar. 23, 1977, 2712705

Int. Cl.[2] B60P *3/00*

U.S. Cl. 414—543 **14 Claims**



1. In a high security transfer system for protecting consignments from theft during their transfer from a vehicle to a receiving apparatus, the improvement comprising an armoured container for containing said consignment, said armoured container including at least two interconnecting means, and interlocking means interlocking said interconnecting means whereby an interconnection with one of said interlocking means is only releasable after an interconnection has been established with another of said interlocking means, said vehicle including at least one interconnecting element, said interconnecting element on said vehicle being interconnected with one of said interlocking means on said container when said container is in said vehicle, a transfer device including an interconnecting element, and said receiving apparatus also including an interconnecting element, whereby to transfer said armoured container from said vehicle to said receiving apparatus, said interconnecting element on said transfer device is interconnected with one of said interconnecting means on said container to enable said interconnection between said container and said vehicle to be released, said transfer device transferring said container to said receiving apparatus where said interconnecting element on said receiving apparatus is interconnected with one of said interconnecting means on said container to enable said interconnection between said transfer device and said container to be released.

4,183,709

PICK UP TRUCK AND WRECKER ASSEMBLY

Dennis W. Morrow, Grosse Pointe Park, Mich., assignor to Eagle Industries, Inc., Dearborn, Mich.

Filed Nov. 21, 1977, Ser. No. 853,317

Int. Cl.[2] B60P *3/12*

U.S. Cl. 414—563 **4 Claims**

1. In combination with a pickup truck having a frame, rear axle, battery, a cab and floor with side walls, all mounted upon said frame;

a portable wrecker assembly kit for modifying said pickup truck comprising a hollow rectangular sub-frame assembly mounted upon said floor and secured to said frame;

a V-shaped in plan boom including a pair of forwardly diverging side plates, at its rear end adapted to lift a load through a conventional sling;

first means pivotally mounting the forward ends of said side plates upon said sub-frame adjacent said cab;

said sub-frame including at one end a transverse boom mounting angle plate;

said first means including spaced pairs of apertured ears at the ends of said angle plate, and apertured ears at the forward ends of said side plates pivoted to said first ears respectively;

a tower mounting plate of triangular shape with its base spanning and secured to and reinforcing said boom side plates intermediate their ends;

said tower plate projecting above said side plates in a plane at substantially right angles thereto;

a hollow spacer top upon the upper end of said tower mount plate;

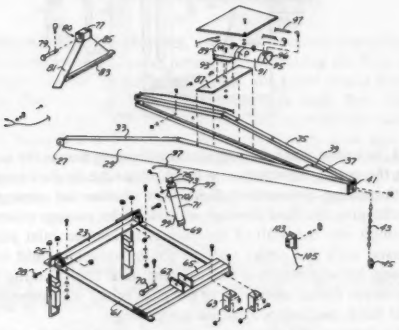
a power cylinder having fittings and including a reciprocal piston rod;

second means pivotally mounting the cylinder at its lower end upon said sub-frame assembly;

said floor having a longitudinal central axis;

said sub-frame assembly including a series of parallel engaging tubular supports extending transversely of said axis, rearwardly of said cab and forwardly of said axle;

said second means including a pair of spaced upstanding ears upon said tubular supports centrally thereof;



a transverse sleeve at the lower end of said cylinder interposed between said ears;

and a pin interconnecting said sleeve and ears on an axis transverse to said longitudinal axis;

third means pivotally mounting the free end of said piston rod upon and within said spacer top;

said third means including a sleeve transversely mounted upon the end of said piston rod and nested within said spacer top;

and a pivot pin extending through said spacer top and said latter sleeve;

a power pack including a motor, pump, valve with an inlet and outlet and a reservoir mounted upon said boom intermediate its ends said power pack lying below the upper surface of said boom and a cover plate connected to the upper surface and spanning said boom side plates and overlying said power pack;

and conduits respectively interconnecting said inlet and outlet with said fittings;

said sub-frame assembly, boom with tower mounting plate, power cylinder, power pack and conduits defining a compact kit adapted for convenient assembly upon the floor of said pickup truck.

4,183,710

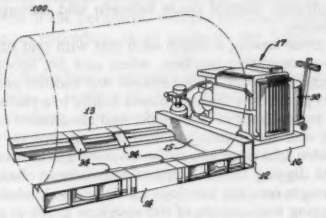
PAPER ROLL TRANSPORTER

Robert E. Burdick, Santa Barbara, Calif., assignor to Rolair Systems, Inc., Santa Barbara, Calif.

Filed Apr. 3, 1978, Ser. No. 893,042

Int. Cl.[2] B60V *1/18*

U.S. Cl. 414—671 **10 Claims**



1. In an air bearing transporter for large cylindrical loads, the combination of:

a U-shaped frame having first and second spaced arms joined by a cross member;

a plurality of air bearings carried in each of said arms;

a pair of load lifters carried in each of said arms, each of said lifters including a pad for engaging a load and means for moving the pads in one arm laterally toward and away from the pads in the other arm; and

control means for providing air under pressure to said air bearings, wherey the transporter may be moved into lifting position with a load between said arms, said air bearings may be deflated, said lifter pads may be engaged with the load, and said air bearings may be inflated to lift the load for lateral movement.

4,183,711

MOBILE POWER SHOVEL

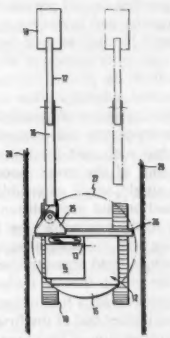
Hans Schaeff, P.O. Box 20, 7183 Langenburg, Fed. Rep. of Germany

Continuation of Ser. No. 754,528, Dec. 27, 1976, abandoned. This application Aug. 1, 1978, Ser. No. 929,905

Claims priority, application Fed. Rep. of Germany, Dec. 24, 1975, 2558799

Int. Cl.[2] E02F *3/32*

U.S. Cl. 414—695 **4 Claims**



1. In a mobile power shovel comprising a vehicle chassis, an upper carriage including a counterweight mounted on said chassis for rotation through an arc of 360° about a vertical slewing axis, said carriage further including an attachment holder for an excavator jib pivotable to both sides about a vertical axis out of a position parallel with the longitudinal axis

of said carriage, a scoop arm pivotally mounted to said jib and a digging tool operably mounted on said scoop arm, the improvement comprising:

said attachment holder being pivotally mounted within the envelope circle of said carriage on a support having operating positions at lateral ends of a transverse guide,

said guide being arranged chordally within said envelope circle and spaced from the slewing axis a distance determined approximately by a swivel ring connection for hydraulic control ducts between said carriage and said chassis,

said guide having a length such that with said support in its fixed operating position, when said jib, scoop arm and digging tool are folded against one another and are laterally pivoted by the attachment holder to a position parallel to and in front of said guide, said attachment holder, said jib, said scoop arm and said digging tool are positioned within said envelope circle whereby material taken up by said digging tool in front of said vehicle chassis may be brought into the envelope circle and unloaded from said digging tool outside of the envelope circle at the rear of said vehicle chassis by rotation of said support.

4,183,712

DEVICE IN LOADING CRANES

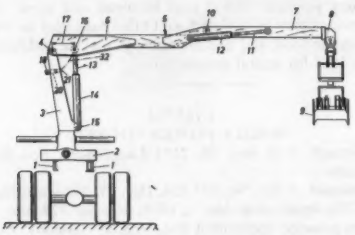
Hans E. Lindberg, Forsa, Sweden, assignor to HIAB-FOCO Aktiebolag, Sweden

Filed Nov. 9, 1977, Ser. No. 849,781

Claims priority, application Sweden, Dec. 10, 1976, 7613905

Int. Cl.[2] B66C *13/12*

U.S. Cl. 414—738 **1 Claim**



1. In a loading crane, a generally upright post for movement around a vertical axis, a folding articulated crane boom including an inner section pivoted to said post for vertical swinging movement, a boom raising and lowering cylinder-piston unit having one end thereof pivoted to said post and having its other end pivoted to said inner section of the crane boom near but spaced somewhat from the pivotal connection between the post and said inner section, whereby when said boom is folded so that the inner section is in general parallelism with said post the axis of said cylinder-piston unit assumes substantially a dead center relationship with said pivotal connection and is unable to initiate raising of the crane boom toward a load handling position, a single small extensible and retractable power device only fixed on said post substantially perpendicular to the upright axis of the post somewhat below the pivotal connection between the post and said inner section, said single power device comprising a fluid pressure operated small cylinder-piston unit with the piston thereof including a rod extension having sliding contact with a hub element of said pivotal connection between said other end of the first-named cylinder-piston unit and said inner section of the crane boom, the operational axis of said small extensible and retractable power device being approximately tangent to the arc of a circle centered on the pivotal connection of said inner section of the boom with said post and with said arc intersecting the axis of the pivotal connection between said inner section and the boom raising and lowering cylinder-piston unit, said power device being operable to push said last-named pivotal connection laterally of the post sufficiently to move the axis of said cylinder-piston unit away from the dead center relationship with the pivotal connection between the post and the inner section of said boom.

4,183,713

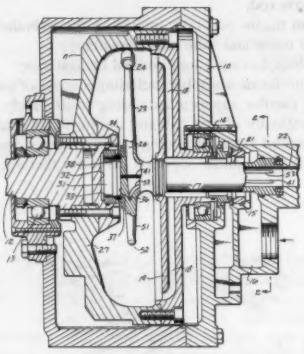
PITOT PUMP WITH JET PUMP OPERATED THRUST BALANCE

John W. Erickson, Huntington Beach, and Francis B. Brown, La Crescenta, both of Calif., assignors to Kobe, Inc., Huntington Park, Calif.

Division of Ser. No. 632,403, Nov. 17, 1975, abandoned. This application Jan. 9, 1978, Ser. No. 867,711

Int. Cl.[2] F04D *1/14*

U.S. Cl. 415—89 **10 Claims**



1. In a pitot pump having a casing, bearing means for mounting the casing for rotation, a fixed pitot tube in the casing for withdrawing pressurized fluid from within the casing and discharging the fluid through an axial outlet passage extending through one end wall of the casing, an annular inlet passage coaxial with the outlet passage for introducing fluid to the casing; balance means for minimizing axial thrust on the bearing means during operation of the pitot pump with pressurized inlet fluid, said balance means comprising:

a balancing chamber one portion of which is defined by an end wall of the casing opposite the end wall through which the inlet and outlet passages extend, the other portion of which is defined by an end of the pitot tube opposite the outlet passage;

rotary seal means for sealing the balancing chamber from within the casing;

a jet pump having a jet inlet, a suction inlet and an outlet;

feed means for applying pressurized fluid to the jet inlet of the jet pump;

a fluid conduit connecting the balancing chamber with the suction inlet of the jet pump; and

means for discharging fluid from the jet pump outlet into the pitot pump inlet.

4,183,714

LUBRICANT SEALING MEANS FOR A COMPRESSOR SHAFT

Martin C. Gosling, High Wycombe, England, assignor to Compair Industrial Limited, High Wycombe, England

Filed Nov. 14, 1977, Ser. No. 851,351

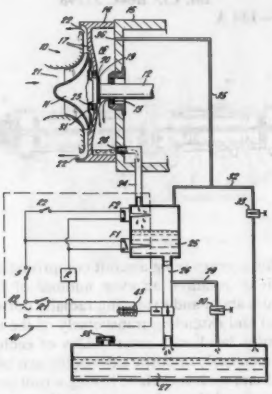
Claims priority, application United Kingdom, Nov. 23, 1976, 48865/76

Int. Cl.[2] F04D *29/08*

U.S. Cl. 415—112 **6 Claims**

1. A compressor comprising at least one stage including an

impeller mounted for rotation on a shaft and rotatable in an impeller housing, a transmission drivingly connected to the shaft, a bearing supporting the shaft and means to lubricate the bearing, the lubrication means providing a continuous lubricant seal around the shaft between the shaft and the bearing to prevent air leaking through the bearing, and the compressor further comprising a chamber located between the impeller housing and the bearing, an outlet from the chamber for draining lubricant from the chamber, a tank for lubricant connected to the chamber outlet, valve means for controlling the flow of lubricant from the chamber to the tank, the valve means comprising flow control valve means having a high flow rate condition and a low flow rate condition, and wherein the valve means comprises a first valve which is always open and a second valve switchable between closed and open conditions arranged in parallel with the first valve, for switching the valve means between its low and high flow rate conditions.

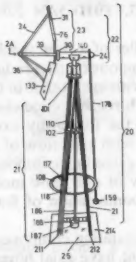


4,183,715

ADJUSTABLE VANE WINDMILLS

William L. Ducker, Lubbock, Tex., assignor to First National Bank of Lubbock, Lubbock, Tex.

Filed Feb. 1, 1978, Ser. No. 874,222
Int. Cl.² F03D 7/04
U.S. Cl. 416—41 **13 Claims**



1. An adjustable vane windmill comprising, in operative combination, a frame assembly, a rotor and control assembly, said rotor and control assembly comprised of a rotor assembly and a control assembly, said rotor and control assembly rotatably supported on said frame assembly, said frame assembly supported on the ground;

said rotor assembly comprising a hub, a plurality of rotor blades, struts, a rigid straight blade control shaft and a rigid straight shaft support sleeve, said rotor blades rotatably supported on said hub,

each of the rotor blades comprising a rigid blade frame and a rigid bent spar, a vane surface cover for said frame, each bent spar having a central straight portion and a peripheral straight portion bent at an angle to said central straight portion, each of the peripheral and central straight portions joined at a bend therebetween, each of the central straight portions rotatably supported on said hub, each of the peripheral straight portion of each of the bent spars extending at an angle to the length of said control shaft.

each blade frame having an inner, central, edge and an outer, radial edge, a leading edge and a trailing edge and said cover forming a windward vane surface on one side thereof and a rear vane surface on the other side thereof,

one portion of a pivotal strut-vane joint firmly attached to each blade frame intermediate the inner, central, edge and the outer, radial, edge thereof, the peripheral portion of each spar being attached to a blade frame,

said hub firmly supported on and attached to the shaft support sleeve and said sleeve rotatably supported on said control assembly, said hub comprising a rigid plate firmly fixed to said sleeve and supporting spar shaft bearings, the central straight portion of each of said spars pivotally held on said hub in a bearing in a radially symmetrical array about said sleeve,

said blade control shaft being co-axial with said shaft support sleeve and supported by said shaft support sleeve and being movable along the length of said shaft-support sleeve,

a collar firmly fixed to said blade control shaft at its rear end and supporting one part of each of a plurality of a strut-collar joints at positions equispaced around said collar

a second part of a vane-strut joint fixedly attached to one, radial, end of each of said struts, and a second part of a strut-collar joint fixedly attached to the other, central, end of each of said struts distant from said one end, said first and second parts of said vane-strut joint and said first and second parts of said vane-collar joints being pivotally connected, and each of said struts being rigid and extending from a strut-vane joint on the rotor blade to a strut-collar joint, and power output means operatively connected to said shaft support sleeve,

said frame assembly comprising a vertically extending pedestal support and a pedestal on said support and said rotor and control assembly rotatably mounted on said pedestal for rotation about a vertical axis, and

said control assembly comprising longitudinally movable means attached to said blade control shaft.

4,183,716

AIR-COOLED TURBINE BLADE

Kitao Takahara, Tachikawa; Hiroyuki Nose, Tokyo; Makoto Sasaki, Komae, and Kimio Sakata, Chofu, all of Japan, assignors to The Director of National Aerospace Laboratory of Science and Technology Agency, Toshio Kawasaki, Tokyo, Japan

Filed Jan. 4, 1978, Ser. No. 866,819
Claims priority, application Japan, Jan. 20, 1977, 52/5352
Int. Cl.² F01D 5/18
U.S. Cl. 416—96 A **4 Claims**

1. In a hollow, air-cooled turbine blade of the type having a plurality of ridges and projections extended inwardly from an interior surface of said blade, an insert snuggly fitted into a space defined by said ridges and projections and supported thereby and cooling air passage means for communicating the space inside said insert with an exterior blade surface, comprising the improvement wherein said cooling air passage means comprises first air passage means for communicating said space through a space defined between said insert and a wall of said

blade with the exterior blade surface; and second air passage means for communicating said space within said insert through

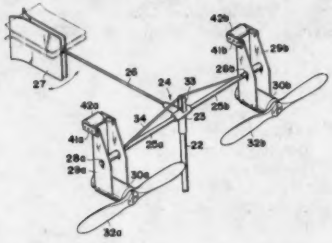
at least some of said projections directly with the exterior blade surface of said blade.

4,183,717

WINDMILL STRUCTURE

Motohiro Yamada, 666-4, Kotoniyojo 6-chome, Nishi-ku, Sapporo-shi, Hokkaido, Japan

Filed Mar. 3, 1978, Ser. No. 883,315
Claims priority, application Japan, Mar. 10, 1977, 52/26263
Int. Cl.[2] F03D *7/04*
U.S. Cl. 416—121 **7 Claims**



1. A windmill structure comprising:

a vertically extending tower;

a horizontal structure rotatably supported on an upper portion of said tower and extending transversely thereof so that said horizontal structure is rotatable about an axis of said tower in accordance with a change of wind direction;

pivot members having horizontal axes connected to said horizontal member at predetermined positions thereof so that said horizontal member is balanced with respect to the axis of said tower, said pivot members having lower portions positioned below the axes and upper portions positioned above the axes;

electric generators mounted to the lower portions of each of said pivot members;

sails rotationally connected to each of said electric generators; and

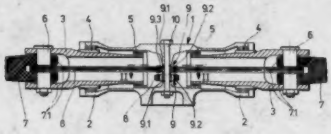
weight members connected to upper portions of each of said pivot members, said weight members being mounted opposite to said sails relative to vertical planes which pass through the axes of said pivot members.

4,183,718

ROTOR FOR A ROTARY WING AIRCRAFT

Karlheinz Mautz, Ottobrunn; Emil Weiland, Hohenbrunn, and Alois Schwarz, Ottobrunn, all of Fed. Rep. of Germany, assignors to Messerschmitt-Bölkow-Blohm GmbH, Munich, Fed. Rep. of Germany

Filed Nov. 29, 1977, Ser. No. 855,668
Claims priority, application Fed. Rep. of Germany, Dec. 11, 1976, 2656296
Int. Cl.[2] B64C *27/48*
U.S. Cl. 416—134 A **4 Claims**



1. A rotor for a rotary wing aircraft comprising a rotor head having an axis of rotation, an even number of rotor blades arranged in pairs about and extending radially outwardly from said rotor head and extending transversely of the axis of rotation of said rotor head, said rotor blades of each pair being located on diametrically opposite sides of the axis of rotation of said rotor head and each said blade having a root positioned on the radially inner end thereof spaced radially outwardly from the axis of rotation of said rotor head, roller bearings carried by said rotor head pivotally supporting each of said rotor blades, a torsionally elastic connection member extending through said rotor head and between and connecting the roots of a pair of rotor blades, and bearing means supporting said connection member at its longitudinal center in said rotor head concentric to the axis of rotation of said rotor head for providing pivotal movement of said connection member about the longitudinal axis thereof.

4,183,719

COMPOSITE IMPELLER WHEEL WITH IMPROVED CENTERING OF ONE COMPONENT ON THE OTHER

Hanns-Günther Bozung, Neusass-Westheim, Fed. Rep. of Germany, assignor to Maschinenfabrik Augsburg-Nürnberg Aktiengesellschaft (MAN), Augsburg, Fed. Rep. of Germany

Filed May 2, 1977, Ser. No. 792,508
Claims priority, application Fed. Rep. of Germany, May 13, 1976, 2621201
Int. Cl.[2] F01D *5/04, 5/06*
U.S. Cl. 416—183 **2 Claims**

1. A composite impeller of a flow machine composed of a forwardly extending component and a radially extending component axially aligned with each other in close proximity and each having vanes which register edgewise with the vanes of the other, the vanes of the forwardly extending component being shaped to operate with axial flow of a flow medium and the vanes of the radially extending component being shaped to operate with radial flow of said flow medium, said impeller incorporating also the combination of features consisting in that:

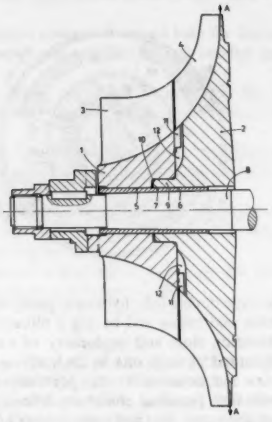
both said forwardly extending component and said radially extending component have axial bores and are mounted on a common shaft that passes completely through both of them, said shaft having a tapered surface facing the narrowest portion of the bores of said components, with the diameter decreasing forwardly;

said radially extending component (**2**) has an annular forward extension (**9**) concentric with said shaft (**8**) and said forwardly extending component (**1**) is firmly mounted and centered on said shaft and has a recess (**10**) into which said forward extension (**9**) of said radially extended component

fits for centering said radially extending component on said forwardly extending component (1);

said forwardly extending component (1) is shrink-fitted onto said forward extension (9) of said radially extending component (2);

a sleeve (7) is interposed between the tapered portion of said shaft and said bores of said components and wedged firmly therebetween for centering said forwardly extending component and transmitting driving force between



said shaft and at least said forwardly extending component, and

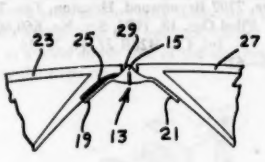
in the region adjacent to the base of the vanes (3,4) the substantially transverse end surface of one component facing the other component has at least two radially running grooves and the facing end surface of the other component has at least two gripping claw ridges (11) each extending into one of said grooves, said grooves being longer than said ridges to allow relative radial movement.

4,183,720

COMPOSITE FAN BLADE PLATFORM DOUBLE WEDGE CENTRIFUGAL SEAL

James W. Brantley, Fairfield, Ohio, assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jan. 3, 1978, Ser. No. 866,726
Int. Cl.² F01D *5/22*
U.S. Cl. 416—193 A **3 Claims**



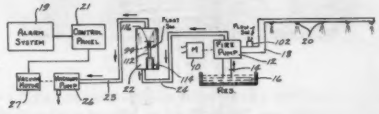
1. In a turbojet engine having a rotatable turbine wheel, turbine blades with blade platforms secured about the periphery of the wheel, said blade platforms being provided with clearance gaps between the adjacent edges thereof to allow for individual relative rotational movement of said turbine blades around their minor root axes; sealing means for preventing turbine air from escaping through the gaps between the blade platforms, said sealing means comprising an elongated flexible ribbon-like member having a left leg portion extending outwardly to the left and a right leg portion extending outwardly to the right, a central wedge portion between said left and right leg portions, at least one invagination on the inner side of said wedge portion facing the turbine wheel axis, said central wedge portion being positioned directly under the gap between two adjacent blade platforms, the left leg portion of said sealing means being fixedly bonded to the underside of one blade platform, the sealing means being urged radially outward at the engine operating speed in response to centrifugal force causing the wedge portion of the sealing means to enter and fill the gap between the blade platforms causing the invagination to close and the right leg portion of the sealing means to press against the underside of the next adjacent blade platform thereby providing the required seal.

4,183,721

APPARATUS FOR AUTOMATICALLY WATER CHARGING A CENTRIFUGAL FIRE PUMP

Reuben E. Peterson, Fergus Falls, Minn., assignor to Jenoff, Inc., Fergus Falls, Minn.

Filed Jan. 13, 1978, Ser. No. 869,377
Int. Cl.² F04D *9/04;* **F04B** *49/04;* **A62C** *35/16*
U.S. Cl. 417—40 **2 Claims**



1. In combination,

a source of water,

a fire pump means comprising an electric motor connected to a centrifugal pump, said pump being positioned at a level above said water source, said pump having a suction line in communication with said water source, said pump having a discharge line extending to an area to be protected in the event of a fire,

a fire alarm system at said area to be protected,

a flow switch in said pump discharge line,

a vacuum system including an electric motor driven vacuum pump in operative communication with the upper end of an upstanding hollow cylinder means, a vacuum line in communication with said cylinder means at the lower end thereof and extending to said fire pump means and being in communication with the interior thereof,

a vertically disposed hollow tube positioned in said hollow cylinder means and being sealed so that water in said cylinder means cannot enter said tube,

a normally open magnetic float switch positioned in said tube above the lower end thereof,

a float vertically movably mounted on said tube for closing said float switch when the water level in said cylinder means reaches a predetermined level,

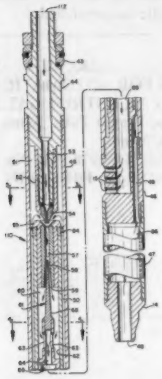
control means connecting said alarm system, vacuum system, flow switch, float switch and electric motor of said fire pump means whereby said vacuum system is initially actuated by said alarm system in the event of a fire so that a vacuum is created in said cylinder means, said vacuum line and said fire pump means to draw water upwardly through said suction line, fire pump means, vacuum line and cylinder means; said fire pump means being activated and said vacuum pump simultaneously being deactivated when said float causes said float switch to be closed; the operation of said fire pump means causing the water level to drop in said cylinder means thereby opening said float switch; said flow switch remaining closed with said fire pump means being continuously operated until said flow switch senses a predetermined drop in pressure in said pump discharge line thereby causing said flow switch to open and to deactivate said fire pump means and to reactivate said vacuum pump to initiate another priming cycle.

4,183,722

DOWNHOLE JET PUMPS

George K. Roeder, P.O. Box 4335, Odessa, Tex. 79760

Filed Jun. 6, 1977, Ser. No. 803,977
Int. Cl.[2] F04F 5/00
U.S. Cl. 417—172 6 Claims



1. A jet pump for producing a well comprising a main body having an axial bore formed therethrough; a power fluid inlet connected to said axial bore at one end of said main body; means forming a produced fluid outlet for conducting fluid flow from the other end of said main body; a nozzle axially aligned with said main body and having a jet end spaced from an inlet end, a suction annulus formed between said nozzle and said main body, means by which said one end of said main body is connected to said power fluid inlet such that power fluid can flow into said one end, into said nozzle, and out of said jet end;

a formation fluid inlet connected to said other end of said main body, means forming a flow passageway which extends from the last said inlet into said suction annulus;

a venturi having a throat axially aligned with said nozzle, said throat having an inlet end and an outlet end, said inlet end of said throat being placed adjacent to said jet end of said nozzle;

a deflector means having a supported end and a free end extending away therefrom and received within the outlet end of the throat of the venturi, with there being an annular passageway formed between the deflector and the throat;

said venturi divides said axial bore into an upper chamber and a lower chamber; said nozzle being located in said upper chamber; said deflector means being located in said lower chamber; means by which said deflector means is supported within said lower chamber;

said annular chamber which is formed between said deflector and said venturi throat increases in cross-sectional area in a downstream direction; and,

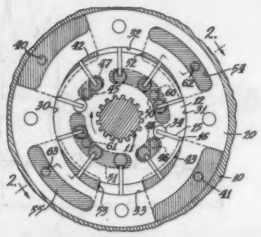
means connecting said produced fluid outlet to said lower chamber, including a passageway formed through a lower marginal end of said deflector and connected to the last said outlet.

4,183,723

ROTARY VANE PUMP HAVING MULTI-INDEPENDENT OUTPUTS DUE TO STATOR SURFACES OF DIFFERENT CONTOUR

Lowell D. Hansen, and Melvin F. Huber, both of Rockford, Ill., assignors to Sundstrand Corporation, Rockford, Ill.

Continuation-in-part of Ser. No. 573,362, Apr. 30, 1975, abandoned. This application Feb. 2, 1977, Ser. No. 764,913
Int. Cl.[2] F04B 23/10, 49/08, 23/12; F01C 1/00
U.S. Cl. 417—204 5 Claims



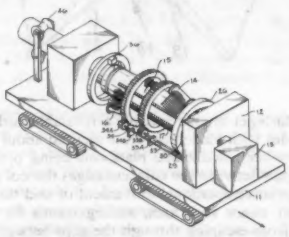
1. A vane-type double lobe hydraulic pump having a casing; a rotor within said casing and having a plurality of generally radially extending slots and a plurality of extensible vanes movably mounted at least one in each of said slots; means providing first and second inner inlet ports selectively communicating with first pumping chambers defined by said rotor slots beneath the vanes, first and second outer inlet ports selectively communicating with second pumping chambers defined by spaces between vanes, first and second inner outlet ports selectively communicating with said first pumping chambers, and first and second outer outlet ports selectively communicating with said second pumping chambers; a pre-formed cam ring surrounding said rotor and having a pair of generally elliptical sections of different radius of curvature to provide a total pumping volume for said first and second pumping chambers when operatively associated with one of said elliptical sections which differs from the total pumping volume when operatively associated with the other of said elliptical sections, said generally elliptical sections being associated one with the first inner and outer inlet ports and the other with the second inner and outer inlet ports; and a pair of casing outlet passages extending one from each of said first and second outer outlet ports.

4,183,724

CONDUIT MAKING APPARATUS

David Larive, 7707 Bryonwood, Houston, Tex. 77055

Filed Oct. 18, 1976, Ser. No. 660,603
Int. Cl.[2] B28B 21/44, 21/56
U.S. Cl. 425—62 13 Claims



1. An apparatus for making conduit by working concrete into a conduit mat comprising;

(a) a base;

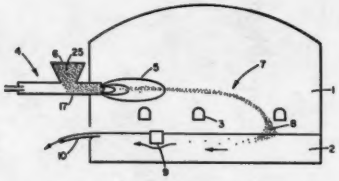
(b) a transmission means connected to said base;
(c) a power means drivingly connected to said transmission means;
(d) form means for shaping said conduit mat connected to said transmission means;
(e) feeder means drivingly connected to said transmission means for applying material on said form means to form a conduit mat of said material;
(f) advancing means connected to said transmission means for advancing said formed conduit mat from said form means;
(g) fastener means connected to said base for fastening said formed conduit mat together as said conduit mat is advanced;
(h) injection means connected to said base for injecting concrete on said conduit mat as said conduit mat is advanced;
(i) a first trowel means connected to said transmission means for working concrete on one side of said conduit mat as said conduit mat is advanced;
(j) a second trowel means connected to said base for working said concrete on the other side of said conduit mat as said conduit mat is advanced; and
(k) curing means connected to said base for curing said concrete to form a concrete conduit.

4,183,725

METHOD AND APPARATUS FOR MELTING GLASS IN BURNER-HEATED TANKS

Hans Garr, Steinbach, and Ulrich Hoffman, Eschborn, both of Fed. Rep. of Germany, assignors to Battelle Development Corporation, Columbus, Ohio

Filed Aug. 31, 1977, Ser. No. 829,571
Claims priority, application Fed. Rep. of Germany, Sep. 4, 1976, 2639977
Int. Cl.[2] F27B *14/00*
U.S. Cl. 432—13 **7 Claims**



1. A method for producing molten glass in a melting furnace comprised of both a glass melting tank heated by a plurality of overhead burners and at least one injection burner positioned above the tank at a level above that of the overhead burners, which comprises the steps of:

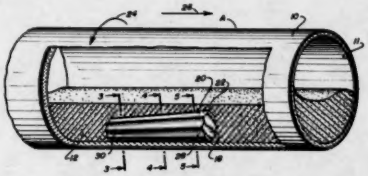
(a) introducing preheated pellets comprised of glass-forming batch components into the injection burner; and,
(b) ejecting the pellets from the injection burner through the flame thereof under the force of a pressurized gaseous medium, whereby the ejected pellets are prefused in the injection burner flame prior to entering the molten glass melt contained in the tank, and whereby the prefused pellets form a veil-like formation which extends over substantially the entire melt surface and over substantially all of the overhead burner flames.

4,183,726

PYRO-PROCESSING ROTARY KILN MIXING ROD

John W. Seebald, Route 9, York, Pa. 17404

Filed Apr. 13, 1978, Ser. No. 895,921
Int. Cl.[2] F27B *7/14*
U.S. Cl. 432—13 **10 Claims**



1. In a high temperature kiln of generally circular cross-section which rotates around its longitudinal axis, having a plurality of zones the temperature of which may be as high as about 4000° F., the feed end thereof being elevated with respect to the discharge end thereof, and wherein there is a tendency during the pyro-processing occurring therein to form a longitudinally extending core of material which has not been properly mixed or heat treated, a mixing and heat-transfer device comprising:

a longitudinally extending rod of heat resistant, conductive material which, by virtue of its weight and configuration, follows a pre-determined travel path within said rotating kiln—said path, in its transverse direction always continually passing through the situs of said longitudinally extending core and, in its longitudinal direction, ranging from downhill travel in the feed direction, through zero longitudinal displacement, to travel uphill counter to the feed direction;

said configuration including an increasing cross-sectional area from one end to the other, the larger cross section facing toward the discharge end of the kiln when the predetermined longitudinal travel path ranges from zero displacement to travel uphill,

said configuration, being further, for any given weight of rod, a mathematical function of parameters including the rotational speed of the kiln, its slope and the type of material being processed;

whereby heat is transferred via said rod to said core and material at said core situs is mixed.

4,183,727

PROCESS FOR THE PRODUCTION OF WATER-INSOLUBLE AZO DYESTUFFS ON THE FIBER

Hasso Hertel, Mühlheim, and Peter Frey, Hofheim am Taunus, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Continuation of Ser. No. 802,495, Jun. 1, 1977, abandoned. This application Jun. 12, 1978, Ser. No. 914,924

Claims priority, application Fed. Rep. of Germany, Jun. 5, 1976, 2625517

Int. Cl.[2] C09B *27/00*

U.S. Cl. 8—46 2 Claims

1. A process for the production of water-insoluble azo dyestuffs on vegetable fibers according to the methods of the ice color technique, wherein the fibrous material is at first impregnated with an azo coupling component and the impregnated material is subsequently developed with a diazo solution of an aromatic amine in the neutral or slightly alkaline range, the improved process is characterized by the use of an alkali metal borate to neutralize the diazo solution.

4,183,728

PROCESS FOR DETERMINING THE OZONE CONTENT OF OZONE-CONTAINING GAS MIXTURES

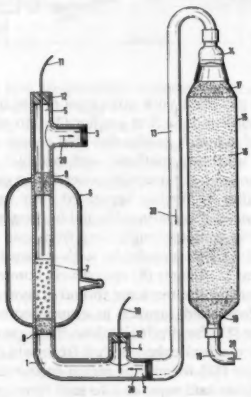
Ortwin Leitzke, Kaarst; Josef Cremer, Hurth, and Erhard Albrecht, Dusseldorf, all of Fed. Rep. of Germany, assignors to Messer Griesheim GmbH, Frankfurt am Main, Fed. Rep. of Germany

Filed Feb. 9, 1978, Ser. No. 876,519

Claims priority, application Fed. Rep. of Germany, Feb. 18, 1977, 2706992

Int. Cl.[2] G01N *25/20, 31/06, 31/10;* B01D *53/04*

U.S. Cl. 23—232 E 5 Claims



1. In a process for the determination of the ozone content of ozone-containing gas mixtures containing nitrogen oxides according to which ozone is converted to oxygen, with the production of heat, by means of a catalyst; the catalyst consists essentially of a mixture of cupric oxide and manganese dioxide, whereby the occurring temperature increase serves as a measure of the ozone concentration, whereby the ozone of a stream of the gas mixture is completely converted to oxygen, and wherein the catalyst is heat insulated; the improvement being channeling the gas mixture through an adsorbent of aluminosilicate to extract nitrogen oxide and water before measuring the ozone content, with the aluminosilicate containing 2 to 20% by weight of aluminum oxide, and the aluminosilicate being of spherical shape with a particle diameter of 2 to 5 mm and a specific area of 200 to 650 m^2/g and an average pore diameter of 5 to 10 mm.

4,183,729

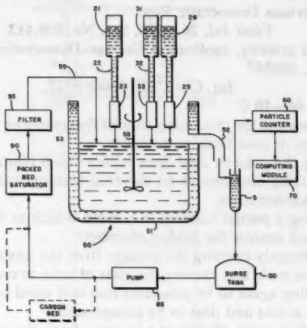
APPARATUS AND METHOD FOR DETERMINING CRYSTALLIZATION PROPERTIES OF URINE

Alan D. Randolph, Tucson, Ariz., assignor to University Patents, Inc., Norwalk, Conn.

Continuation of Ser. No. 881,655, Feb. 27, 1978, abandoned. This application Jul. 17, 1978, Ser. No. 925,172

Int. Cl.[2] G01N *15/06, 21/22, 33/16*

U.S. Cl. 23—230 B 32 Claims



1. A method for determining crystallization properties of urine to study stone formation therein, comprising the steps of:

loading a continuous crystallizer with a fluid containing synthetic urine and an aliquot of natural urine;

recirculating the fluid from an output of said continuous crystallizer back to an input of said continuous crystallizer; and

measuring the crystal populations of the fluid.

25. Apparatus for determining the crystallization kinetics of urine to study stone formation therein, comprising:

a continuous crystallizer chamber for containing a fluid which includes synthetic urine and an aliquot of natural urine;

means for recirculating the fluid from an output of said continuous crystallizer back to an input of the continuous crystallizer;

means for sampling the fluid;

particle counting means for receiving the sampled fluid; and

computing means responsive to the output of said particle counting means for determining the crystallization kinetics occurring in said crystallizer.

4,183,730

HYDRODESULFURIZATION OF COAL WITH HYDROGEN PEROXIDE IN BRINE SOLUTION

Michael A. Dondelewski, Columbus, Ohio, assignor to Coalmet Corporation, Columbus, Ohio

Continuation-in-part of Ser. No. 827,450, Aug. 25, 1977, Pat. No. 4,127,390. This application Oct. 25, 1978, Ser. No. 953,011

The portion of the term of this patent subsequent to Nov. 28, 1995, has been disclaimed.

Int. Cl.[2] C10L *9/10;* C10B *57/00*

U.S. Cl. 44—1 SR 4 Claims

1. A method of treating coal to reduce total sulfur content consisting of

a. crushing and sizing the coal to a more or less homogenous size,

b. combining the coal with a solution of hydrogen peroxide and sodium chloride,

c. heating the coal in the solution just sufficiently to start a reaction,

d. holding the coal in the solution at a moderately elevated temperature for a period of time until the reaction is complete,

e. removing the coal from the solution and washing with hot water, and

f. recovering coal having a reduced sulfur and ash content.

4,183,731

PROCESS AND APPARATUS FOR PRODUCING SHAPED LUMPS FROM COKE FINES OR CHARCOAL FINES

Ursula Eisel, Berlin, German Democratic Rep., assignor to Bauakademie der Deutschen Demokratischen Republik, Berlin, German Democratic Rep.

Filed Jul. 26, 1978, Ser. No. 928,413

Claims priority, application German Democratic Rep., Aug. 12, 1977, 200547

Int. Cl.[2] C10L *5/00, 5/22*

U.S. Cl. 44—10 C **8 Claims**

1. A process for producing shaped fragments or lumps from coke fines or coal fines comprising

mixing the coke or coal fines with a liquid binding agent in a mixing chamber at an elevated temperature to form a suspension mass;

applying a partial vacuum in a mold which at that point is closed against the mixing chamber;

then abruptly opening the passage from the mixing chamber to the mold and causing the mass of coke or coal fines and binding agent to be propelled into said mold by an implosion action and thus to be compressed;

then after again closing the passage from the mold to the mixing chamber removing the excess liquid in the binding agent from the mold by suction resulting in further compression of the mass of coke or coal fines;

at the same time imparting lines of thinned cross section to the mass through protruding means in the interior surface of the mold; and

finally causing the mass to drop into storage means while simultaneously breaking up the mass into individual lumps or fragments along the said thin cross section lines.

5. An apparatus for producing shaped lumps or fragments from coke fines or coal fines, the said apparatus comprising

a mixing chamber for mixing the coke or coal fines with a liquid binding agent to form a coke or coal suspension mass;

means for applying heat to said mixing chamber;

a mold;

a passage connecting said mold with said mixing chamber;

a closure adapted to open and close said passage from the mixing chamber to the mold;

means for applying a vacuum to said mold;

a discharge opening for said mold;

means for opening and closing said discharge opening;

collection means for receiving the formed mass when dropped from said mold; and

protruding ridges provided in the interior surface of said mold for forming notches in said mass upon compression of the mass by being abruptly forced into the evacuated mold upon opening said closure means after applying said vacuum, the said notches causing the mass to split into individual lumps or fragments upon dropping into said collection means.

4,183,732

USE OF QUATERNARY AMMONIUM SALTS OF NITROGEN CONTAINING POLYMERS FOR IMPROVED CARBURETOR DETERGENCY

Paul F. Vartanian, Wappingers Falls, and Joseph B. Biasotti, Lagrangeville, both of N.Y., assignors to Texaco Inc., White Plains, N.Y.

Filed Dec. 14, 1977, Ser. No. 860,548

Int. Cl.[2] C10L *1/20*

U.S. Cl. 44—62 **5 Claims**

1. A motor fuel composition comprising a gasoline base fuel and from 0.005 to 1 weight percent of a detergent reaction product where said detergent reaction product is obtained by preparing an initial reaction mixture consisting of from 5 to 30 weight percent of butyl methacrylate, 50 to 81 weight percent of a higher ester of methacrylic acid consisting of between 10 and 25% by weight of C_{16}–C_{20} esters of methacrylic acid and 40 to 60 weight percent of a C_{12}–C_{15} aliphatic ester of methacrylic acid, from 4 to 20 weight percent of a nitrogen containing compound selected from the group consisting of 4-vinylpyridine and dimethylaminoethyl methacrylate and reacting said initial mixture in the presence of a polymerization catalyst and polymerization initiator to produce a first reaction product, admixing said first reaction product with an alkyl halide represented by the formula RX wherein R is an alkyl radical having from 1 to 8 carbon atoms to form a second reaction mixture and reacting said second reaction mixture at a temperature ranging from 40° to 150° C. to form said detergent reaction product.

4,183,733

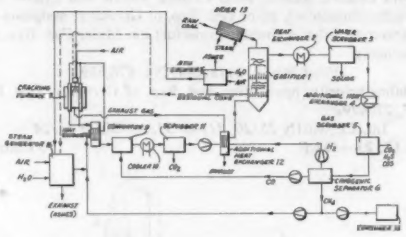
HYDRO GAS PLANT WITH UTILIZATION OF THE RESIDUAL COKE

Walter Jäger, Schulweg 33, 5250 Engelskirchen, Cologne, Fed. Rep. of Germany

Filed Feb. 21, 1978, Ser. No. 879,192

Int. Cl.[2] C10J *3/68*

U.S. Cl. 48—77 **9 Claims**



1. A hydro gas plant with utilization of residual coke, comprising, in combination: a first gasifier (**1**) into which raw coal is introduced for hydro gasification that results in the production of a gas including methane with residual coke as a by-product; a cryogenic separator (**6**) wherein the gas exiting from said first gasifier is further separated into its constituents, namely methane, carbon monoxide and hydrogen; a furnace (**7**) for cracking the methane originating from said separator into hydrogen and carbon monoxide with exhaust gases as by-products; a heat exchanger (**8**) operatively connected with said furnace for passing the methane to and conversely a cracked gas mixture from said furnace in countercurrent fashion; a second gasifier (**15**) for producing low-BTU gas from at least a portion of the residual coke derived from said first gasifier; a steam generator (**16**) for adding steam to the methane before being passed from said separator to said furnace through said heat exchanger; and means for utilizing the combustion heat of at least one of the produced residual coke and low-BTU gas by burning in the processes being conducted in at least one of said furnace and said steam generator.

4,183,734

ADSORPTION HEAT PUMP

Colin J. Leppard, Emsworth, and Robert S. E. Leslie, Havant, both of England, assignors to CJB Developments Limited, London, England

Filed May 30, 1978, Ser. No. 910,771

Claims priority, application United Kingdom, Jun. 1, 1977, 23246/77

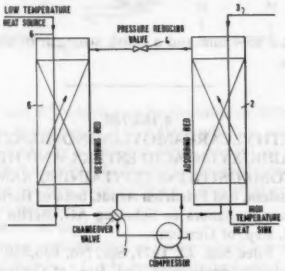
Int. Cl.[2] B01D *53/04*

U.S. Cl. 55—28 **10 Claims**

1. A method for transferring heat from a low temperature reservoir to a high temperature reservoir which comprises the steps of:

(a) bringing an outside low temperature reservoir and an outside high temperature reservoir into heat-exchange-relationship with an adsorption/desorption system comprising a fluid containing an adsorbable component, a first bed of a reversible adsorbent for the adsorbable component, and a second bed of a reversible adsorbent for the adsorbable component connected to each other by means for passing the fluid within the system from the first bed to the second bed, in such a manner that the low temperature reservoir is in heat-exchange-relationship with said first bed and the high temperature reservoir is in heat-exchange relationship with said second bed;

(b) passing said fluid having a reduced content of the adsorbable component through the first bed and desorbing the adsorbable component from the first bed which first bed has previously adsorbed the adsorbable component from said fluid, thereby increasing the content of the adsorbable component in the fluid and causing an amount of heat equal to the consumed heat of desorption of the adsorbable component to be adsorbed by the said first bed, the heat adsorbed being transferred to the said first bed from



the outside low temperature reservoir, in heat-exchange-relationship with the said first bed;

(c) passing the fluid having an increased content of the adsorbable component through the second bed and adsorbing the adsorbable component on the second bed thereby reducing the content of adsorbable component in the fluid and liberating an amount of heat equal to the heat of adsorption of the adsorbable component, the liberated heat being transferred to the outside high temperature reservoir in heat-exchange-relationship with said second bed; and

(d) operating steps (b) and (c) in a cyclical manner by reversing the mode of operation of the said first and said second bed and bringing the first bed in heat-exchange-relationship with an outside high temperature reservoir and the second bed in heat-exchange-relationship with an outside low temperature reservoir when or before the adsorbing bed becomes saturated with the adsorbable component and before the desorbing bed becomes denuded of the adsorbable component, whereby all of the adsorbable component is transferred from bed to bed in a closed loop.

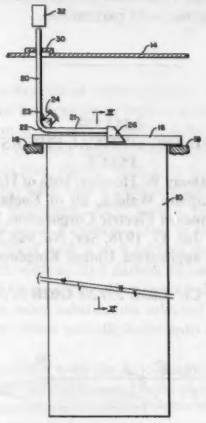
4,183,735

RAPPING SYSTEM FOR ELECTROSTATIC PRECIPITATORS

Yaacov Goland, Pacific Palisades, Calif., and Ronald M. Long, Redmond, Wash., assignors to Joy Manufacturing Company, Pittsburgh, Pa.

Filed Oct. 26, 1978, Ser. No. 954,958
Int. Cl.[2] B03C *3/76*
U.S. Cl. 55—112 **9 Claims**

1. In an electrostatic precipitator, a collecting electrode plate on which particulate matter deposits, a top member extending across the top of said electrode plate for supporting the electrode in a vertical position on a fixed support, an impact transmitting member disposed above the electrode and having a horizontal portion and an upwardly-extending vertical portion, said horizontal portion being rigidly joined to the vertical portion and extending generally parallel to said top member, the horizontal portion being rigidly connected to the



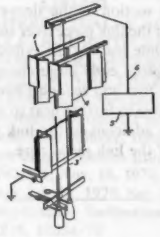
top member at a point intermediate the ends thereof, means for pivotally mounting the impact transmitting member on a fixed support at the joining between the horizontal and vertical portions, and means for repetitively applying impacts to the upper end of the vertical portion.

4,183,736

ELECTROSTATIC PRECIPITATION

Helmut I. Milde, Andover, Mass., assignor to High Voltage Engineering Corporation, Burlington, Mass.

Division of Ser. No. 521,788, Nov. 7, 1974, abandoned, which is a continuation-in-part of Ser. No. 281,405, Aug. 17, 1972, abandoned. This application Aug. 2, 1976, Ser. No. 710,383
Int. Cl.[2] B03C *3/41, 3/66*
U.S. Cl. 55—139 **2 Claims**



1. Apparatus for electrostatic precipitation of particulates by means of a corona current, comprising in combination

at least one collecting electrode plate

at least one corona electrode array

means for establishing a dc voltage between said at least one plate and said at least one array, the geometry of said at least one plate and said at least one array being constructed and arranged so as to produce, upon establishment of said voltage therebetween, an electrostatic field of high intensity and of uniformity sufficient to reduce the field at said at least one corona electrode array to such a degree that the corona current produced thereby is at a level insufficient to precipitate said particulate

means for superimposing upon said uniform electrostatic field a superimposed electrostatic field producing a combined field strength sufficiently high to cause corona, said means for superimposing including means for pulsing said superimposed electrostatic field at a pulse repetition rate sufficiently high to provide said corona current at a level so as to precipitate said particulate.

4,183,737

METHOD OF JOINING OPTICAL FIBERS WITH A LINK PIECE

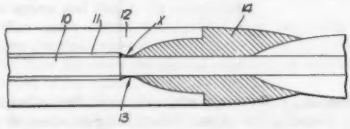
Martin Chown; Anthony W. Horsley, both of Harlow, and David G. Dalgoutte, Saffron Walden, all of England, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Jul. 17, 1978, Ser. No. 925,266

Claims priority, application United Kingdom, Jul. 21, 1977, 30644/77

Int. Cl.[2] **C03C** *23/20;* **G02B** *5/14*

U.S. Cl. 65—4 A **4 Claims**



1. A method of making an optical fiber coupler for first and second optical fibers both of which have the same core cross-section, which method includes the steps of:

providing a glass sleeve whose bore is a clearance fit around the fibers;

positioning a link piece of glass optical fiber having the same core cross-section as the two fibers to be joined and a length which is less than that of the sleeve in the central section of the sleeve so as to leave the bores of both the end sections of the sleeve unobstructed, the link piece comprising a fiber with a cladding layer whose refractive index is less than that of the link piece core;

securing the link piece in position within the sleeve by heating the central section of the sleeve so as to cause it to collapse around the link piece over substantially the whole of its length while leaving the portions of the sleeve beyond the link piece ends large enough to accommodate the ends of the first and second fibers;

subjecting the sleeve to further heat so as to overcollapse the sleeve portions adjacent to the link piece ends to match the diameter of the link piece core.

4,183,738

GRANULATION PROCESS AND PRODUCTS PRODUCED THEREBY

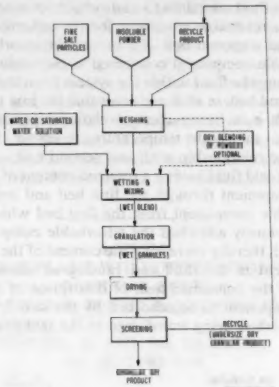
Samuel Carmon, Arad, Israel, assignor to International Fertilizer Development Center, Muscle Shoals, Ala.

Filed May 9, 1977, Ser. No. 795,043

Int. Cl.[2] **C05B** *17/00;* **C05C** *1/02*

U.S. Cl. 71—50 **5 Claims**

1. A granular salt product comprising free flowing granules containing from about 70 to 99% by weight of a water soluble salt selected from the group consisting of ammonium sulfate, ammonium nitrate, potassium chloride and potassium sulfate, from 1 to 30% by weight of an insoluble solid material and about 1% by weight or less of water based upon the combined weight of said salt and said insoluble solid material, said granules having a relatively uniform size distribution in the range of



from about 2 to 4 mm and a crush strength of above about 3 lbs/granule.

4,183,739

2-(DIMETHYLCARBAMOYLIMINO)-BENZTHIAZOLINE-3-CARBOXYLIC ACID ESTERS, AND HERBICIDAL COMPOSITIONS CONTAINING SAME

Ludwig Nusslein, and Friedrich Arndt, both of Berlin, Fed. Rep. of Germany, assignors to Schering AG, Berlin and Bergkamen, Fed. Rep. of Germany

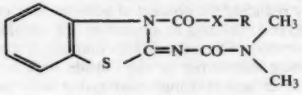
Filed Sep. 22, 1977, Ser. No. 835,530

Claims priority, application Fed. Rep. of Germany, Sep. 30, 1976, 2644425

Int. Cl.[2] **C07D** *277/82*

U.S. Cl. 71—90 **14 Claims**

1. A compound of the formula



wherein

X is oxygen or sulfur; and

R is selected from the group consisting of C_1–C_8 alkyl, C_2–C_8 alkenyl, C_2–C_8 alkinyl, monohalobenzyl, dihalobenzyl and phenyl optionally mono-, di- or trisubstituted by one or more of halogen, C_1–C_3 alkyl, C_1–C_3 alkoxy, C_1–C_3 alkamino or trihalomethyl.

13. A herbicidal composition comprising at least one effective agent as defined in claim 1 in amounts between 10 and 80% by weight of total effective agents and about 90 to 20% by weight of a liquid or solid carrier material.

4,183,740

SOLID COMPOSITIONS OF A LIQUID SURFACTANT AND A PYRAZOLIUM HERBICIDE

Choong-Gook Jang, Princeton, and Nunzio R. Pasarela, Bridgewater, both of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Filed Jan. 5, 1978, Ser. No. 867,254

Int. Cl.[2] **A01N** *17/08*

U.S. Cl. 71—92 **9 Claims**

1. A solid, particulated herbicidal composition comprising from about 27% to about 40%, by weight, of octylphenoxy

polyethoxy ethanol and 73% to 60%, by weight, of 1,2-dimethyl-3,5-diphenylpyrazolium salt.

4,183,741
HERBICIDALLY-ACTIVE HETEROCYCLIC COMPOUNDS

Peter J. West, Cambridge, and John H. Parsons, Saffron Walden, both of England, assignors to Fisons Limited, London, England

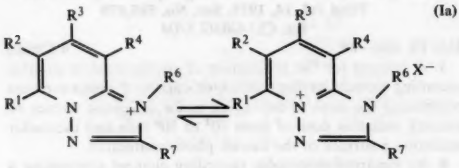
Filed May 20, 1977, Ser. No. 799,127

Claims priority, application United Kingdom, May 21, 1976, 20982/76; Nov. 26, 1976, 49326/76

Int. Cl.[2] A01N *9/02, 9/22;* **C07D** *471/22*

U.S. Cl. 71—92 **11 Claims**

1. A compound of formula Ia:



(Ia)

wherein

R^1, R^2, R^3 and R^4, which may be the same or different, each represent hydrogen; C 1 to 6 alkyl which is unsubstituted or substituted by a halogen atom; phenyl or C 7 to 10 phenylalkyl each of which may be unsubstituted or substituted by a halogen atom or by a C 1 to 6 alkyl group; nitro; cyano; or halogen;

X^- represents an anion;

R^7 represents a pyridinium-2-yl group which is unsubstituted or substituted by a C 1 to 6 unsubstituted alkyl group or a C 1 to 6 alkyl group which is itself substituted by a cyano, carboxy or C 1 to 6 alkoxycarbonyl group;

and R^6 represents a methylene, dimethylene, trimethylene or a C 1 to 6 alkyl substituted ethenylene chain to the nitrogen atom of the group R^7.

9. A method of combating weeds at a locus infested with or liable to be infested with weeds, which method comprises applying to said locus a herbicidally-effective amount of one or more compounds of formula Ia according to claim **1**.

4,183,742
4,5-DICHLORO-IMIDAZOLE-1-CARBOXYLIC ACID ARYL ESTERS AND THEIR USE AS PLANT PROTECTION AGENTS

Klaus Sasse, Berg. Gladbach; Gunther Beck; Ludwig Eue, both of Leverkusen, and Robert R. Schmidt, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

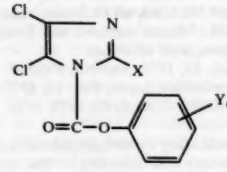
Filed Sep. 21, 1977, Ser. No. 835,092

Claims priority, application Fed. Rep. of Germany, Oct. 13, 1976, 2646143

Int. Cl.[2] C07D *233/28;* **A01N** *9/22*

U.S. Cl. 71—92 **26 Claims**

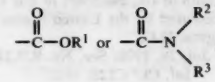
1. A 4,5-dichloro-imidazole-1-carboxylic acid aryl ester of the formula



(I)

in which

X represents a group



in which

R^1 represents a straight or branched alkyl radical with 1 to 6 carbon atoms or straight or branched alkenyl or alkynyl, each with up to 6 carbon atoms, which radicals can be carrying one or more substituents selected from fluorine, chlorine, bromine, alkoxy with 1 to 6 carbon atoms and alkylmercapto with 1 to 6 carbon atoms,

R^2 represents hydrogen, alkyl with 1 to 8 carbon atoms, alkenyl with up to 8 carbon atoms in the formyl group,

R^3 represents alkyl with 1 to 8 carbon atoms or alkenyl or alkynyl, each with up to 8 carbon atoms, it being possible for each of these alkyl, alkenyl and alkynyl radicals to carry one or more substituents selected from alkoxy with 1 to 4 carbon atoms and alkylmercapto with 1 to 4 carbon atoms, or

R^2 and R^3 conjointly with the adjoining nitrogen atom form a heterocyclic radical selected from pyrrolidinyl, piperidinyl and hexamethyleneimidinyl

Y represents halogen, alkyl with 1 to 6 carbon atoms, trifluoromethyl, alkoxy with 1 to 6 carbon atoms, alkylmercapto with 1 to 6 carbon atoms, nitro, cyano or a

group,

in which

R^4 represents alkyl with 1 to 6 carbon atoms and n represents 0, 1, 2, 3, 4, or 5.

26. A method of regulating the growth of a plant which comprises applying to the plant or its habitat a plant growth regulatingly effective amount of a compound according to claim **1**.

4,183,743
NOVEL HERBICIDALLY ACTIVE, NUCLEAR-SUBSTITUTED PHENOXY-PHENOXY-ALKANECARBOXYLIC ACID DERIVATIVES AND USE THEREOF FOR CONTROLLING GRASS-LIKE WEEDS

Otto Rohr, Therwil, Switzerland; Georg Pissiotas, Lörrach, Fed. Rep. of Germany, and Beat Böhner, Binningen, Switzerland, assignors to Ishihara Sangyo Kaisha Ltd., Osaka, Japan

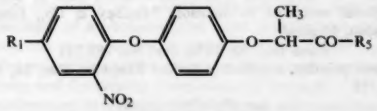
Division of Ser. No. 742,311, Nov. 16, 1976, Pat. No. 4,106,925. This application Jul. 19, 1978, Ser. No. 926,061

Claims priority, application Switzerland, Nov. 20, 1975, 15033/75; Nov. 20, 1975, 15034/75

Int. Cl.[2] A01N *9/12;* **C07C** *153/11*

U.S. Cl. 71—100 **10 Claims**

1. 4-Phenoxy-α-phenoxy-alkanecarboxylic acid derivatives, of the formula:



wherein R_1 represents a halogen atom; and R_5 represents a C_1–C_4 alkylthio group, or a phenylthio group.

4,183,744

METHOD OF FOAMING A LIQUID METAL

Albert K. Fischer, Western Springs, and Carl E. Johnson, Elk Groove Village, both of Ill., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jul. 28, 1978, Ser. No. 929,144
Int. Cl.[2] C22B 5/02
U.S. Cl. 75—20 F 6 Claims

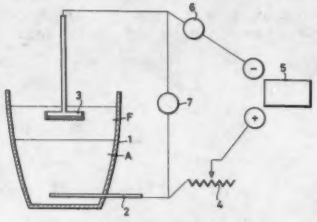
1. A method for forming a foam of liquid metal comprising:
adding to a liquid metal consisting of an alloy of sodium and potassium an effective amount of barium to promote the formation of foam; and
passing an inert gas at a bubble forming rate through the liquid metal containing the barium, thereby forming a foam of the liquid metal.

4,183,745

DEMAGGING PROCESS FOR ALUMINUM ALLOY WITHOUT AIR POLLUTION

Yoshishige Tsumura, 39-7 Minami-Magome 1 chome, Ohta-ku, Tokyo, Japan

Continuation of Ser. No. 757,650, Jan. 7, 1977, abandoned. This application Jan. 25, 1978, Ser. No. 872,224
Claims priority, application Japan, Feb. 16, 1976, 51-14822
Int. Cl.[2] C22B 21/06
U.S. Cl. 75—68 R 2 Claims



1. A process for removing magnesium from aluminum or an aluminum alloy without causing air pollution, which comprises
(a) pouring a melt of aluminum or an aluminum alloy containing magnesium into a vessel,
(b) superposing a layer of molten flux on the melt, the molten flux layer consisting of a mixture of 59% by weight of $MgCl_2$, 20% by weight of KCl, 20% by weight of NaCl and 1% by weight of NaF, or a mixture of 18% by weight of $MgCl_2$, 17% by weight of KCl, 30% by weight of NaCl, 34% by weight of $CaCl_2$ and 1% by weight of NaF, or a mixture of 25% by weight of $MgCl_2$, 60% by weight of NaCl, 14% by weight of $CaCl_2$ and 1% by weight of NaF,
(c) disposing a respective electrode in the melt and the molten flux layer,
(d) passing an electric current between the electrodes until the molten magnesium floats up to the surface of the flux layer, and
(e) removing the magnesium from the flux layer.

4,183,746

CERMETS

Stephen L. Pearce, and Gordon L. Selman, both of London, England, assignors to Johnson, Matthey & Co., Limited, London, England

Filed Dec. 20, 1976, Ser. No. 752,791
Claims priority, application United Kingdom, Dec. 24, 1975, 52806/75
Int. Cl.[2] C22C 32/00
U.S. Cl. 75—234 8 Claims

1. A cermet comprising a first phase of ceramic particles and a second phase of a metallic material wherein at least a major proportion of the particles have their surfaces coated with an additive which bonds together the materials of the first and second phases, said ceramic particles comprising one or more refractory oxides having a melting point greater than that of the metallic material of the second phase, the metallic material comprising gold, silver, ruthenium, rhodium, palladium, osmium, iridium or platinum and the additive comprising at least one member of the group consisting of yttrium, aluminum, titanium, vanadium, chromium and nickel in elemental or compound form.

4,183,747

ELECTROPHOTOGRAPHIC RECORDING ELEMENT, CELLULOSE CARRIER IRRADIATED WITH IONIZING RADIATION, PROCESS AND PRODUCT

John L. Garnett, P.O. Box 1, Kensington, N.S.W., Australia

Filed Jul. 14, 1975, Ser. No. 595,678
Int. Cl.[2] G03G 5/04
U.S. Cl. 430—69 6 Claims

1. A process for the production of an electrophotographic recording element having a cellulosic carrier, the improvement comprising the steps of delivering to the cellulosic carrier an ionising radiation dose of from 10^4 to 10^8 rads and thereafter rendering a surface of the carrier photoconductive.

4. An electrophotographic recording element comprising a cellulosic carrier having at least one photoconductive surface said carrier having an electrical conductivity in the range of 2.10^{-14}–5.10^{-16} $ohm^{-1}cm^{-1}$ resulting from an ionising radiation dose of from 10^4 to 10^8 rads received prior to the said surface being rendered photoconductive.

4,183,748

METHOD OF REMOVING SURFACE IONIC IMPURITIES ON INORGANIC PHOTOCONDUCTIVE MATERIAL

Keiichi Murai, Tokyo, and Takehiko Matsuo, Kawasaki, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 381,403, Jul. 23, 1973, abandoned. This application Sep. 30, 1977, Ser. No. 838,376
Claims priority, application Japan, Jul. 29, 1972, 47-76145
Int. Cl.[2] G03G 5/08; B01D 15/00
U.S. Cl. 430—135 6 Claims

1. A method of improving particles of an electrophotographic photoconductive material selected from the group consisting of Cu_2O, CuI, ZnO, ZnS, ZnSe, CdS, Se-Te, CdSe, CdTe, PbS, Sb_2S_3, In_2Te_3, GeS, GeSe, Tl_2S, (Cd.Zn)S, CdS.CdSe and CdS, which are rendered electrically conductive by exposure to actinic radiation, by removing substantially all surface ionic impurities which might cause deterioration of the photoconductive properties of the particles due to temperature and humidity conditions, said method comprising the steps of washing said particles in an aqueous solution containing at least one type of ion exchange resin to solubilize said ionic impurities from the surface of said particles and then separating said particles from said solution.

4,183,749

PHOTOGRAPHIC FILM WITH POLYETHYLENE TEREPHTHALATE-POLYALKYLENE GLYCOL COPOLYMER SUPPORT

Kenji Yabe; Atsuhiko Soda, both of Otsu; Satoyuki Minami, and Osamu Iida, both of Mishima, all of Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara and Toray Industries Inc., Nihonbashimuro, both of, Japan

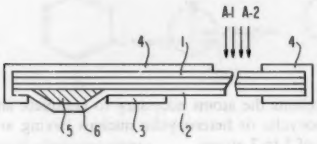
Filed Feb. 10, 1978, Ser. No. 876,800
Claims priority, application Japan, Feb. 10, 1977, 52-12931
Int. Cl.[2] G03C 7/00, 1/40, 1/78, 1/96
U.S. Cl. 430—211 31 Claims

30. A process of producing a photographic diffusion transfer image, comprising image-wise exposing a film unit as below described and discharging an aqueous processing solution

between said two dimensionally stable transparent supports as below described wherein said film unit comprises:

(a) a photosensitive element comprising a dimensionally stable transparent support having thereon the following layers in sequence: an image-receiving layer; an alkaline solution-permeable, light-reflecting layer; an alkaline solution-permeable opaque layer; a red-sensitive silver halide emulsion layer having a cyan dye image-providing compound associated therewith; an interlayer; a green-sensitive silver halide emulsion layer having a magenta dye image-providing compound associated therewith; an interlayer; a red-sensitive silver halide emulsion layer having a yellow dye image-providing compound associated therewith; and a protective layer;

(b) a cover sheet superposed on said protective layer of said photosensitive element and comprising a dimensionally



stable transparent support coated in sequence with a neutralizing layer and a neutralization timing layer; and

(c) a rupturable container retaining an aqueous alkaline processing composition and an opacifying agent, said rupturable container being so positioned during the processing of said film unit that a compressive force applied to said rupturable container causes a discharge of said alkaline processing composition between said cover sheet and said protective layer of said photosensitive element;

wherein said image-wise exposing is through said cover sheet and wherein at least one of said dimensionally stable transparent supports comprises a film of a polyethylene terephthalate copolymer containing about 3 to about 20% by weight of a polyalkylene glycol having a molecular weight of about 300 to about 30,000, as a glycol component comonomer, based on the weight of the polyethylene terephthalate copolymer.

4,183,750

COLOR FILM AND PROCESS FOR DEVELOPING IT

Richard J. Goldberg, 4814 Brandenburg St., Tarzana, Calif. 91356

Continuation of Ser. No. 724,280, Sep. 20, 1976, abandoned, which is a continuation of Ser. No. 572,291, Oct. 7, 1974, abandoned. This application Jul. 15, 1977, Ser. No. 815,947

Int. Cl.[2] G03C *7/16*

U.S. Cl. 430—264 **16 Claims**

1. The method of processing an exposed multi-emulsion layer color film containing silver halide which includes the steps of:

developing said film to form first black and white images formed of metallic silver in said emulsions;

tanning bleaching said first black and white images to remove the metallic silver thereof;

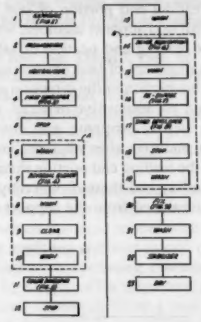
color developing said film in the presence of color couplers to form color images having metallic silver images therewith that are complementary to said first black and white images;

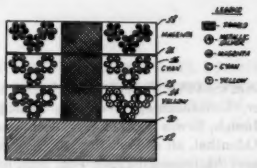
re-oxidizing said complementary metallic images;

re-exposing the re-oxidized image in the outermost of said emulsions, said re-exposing being substantially limited to said outermost emulsion;

developing said re-exposed image in said outermost emulsion to form a silver image therein; and

removing the re-oxidized metallic layers not developed to leave a silver image only in said outermost layer; so as to form a processed film with an outermost layer comprising metallic silver and magenta, an intermediate cyan layer, and a bottom yellow layer, and wherein portions of the layers not containing said color are tanned, whereby the





combination of the silver and magenta in the outermost layer with the tanned portions provides an increased resolution then absent said combination.

4,183,751

STRIPPING AND DEVELOPING PROCESS AND DEVICE THEREFOR

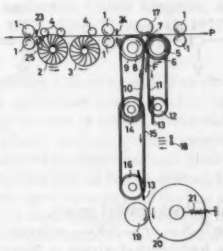
Nobuo Matsumoto; Osami Tsuji, and Shinji Hamada, all of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami Ashigara, Japan

Filed Nov. 22, 1977, Ser. No. 853,914

Claims priority, application Japan, May 6, 1977, 52-51870

Int. Cl.[2] G03C *11/12, 5/24, 1/90*

U.S. Cl. 430—258 **10 Claims**



1. A stripping and developing process for a photosensitive material consisting of a cover base laminated through the intermediary of a photosensitive layer to a support member, wherein the cover base is stripped from the support member thereby providing a visible image on the support member, said stripping and developing comprising the steps of

a preliminary stripping step of stripping said cover base from said support member in the leading end portion of said photosensitive material, said stripping being due to friction in a direction opposite to an advancing direction of

said photosensitive material, followed by the reorientation of the leading end portion of said cover base to the advancing direction of said photosensitive material, thereby bringing the leading end portion of said cover base into registration with said support member, wherein the reorientation of the leading end portion of said cover base to the advancing direction of said photosensitive material is accomplished by friction in the direction of the advancing direction of said photosensitive material, and

a final stripping step of stripping said cover base of said photosensitive material after said preliminary stripping step first from the leading end portion thereof successively towards the trailing end thereof, whereby the cover base is completely separated from the support member.

4,183,752

LIGHT-SENSITIVE PHOTOGRAPHIC MATERIAL

Karl Küffner, Unterhaching; Wolfgang Lässig; Ernst Meier, both of Munich; Erwin Ranz, Leverkusen, and Karl-Wilhelm Schranz, Odenthal, all of Fed. Rep. of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Fed. Rep. of Germany

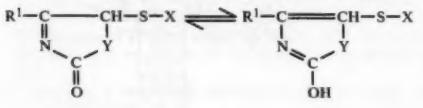
Filed Feb. 16, 1978, Ser. No. 878,238

Claims priority, application Fed. Rep. of Germany, Feb. 21, 1977, 2707489

Int. Cl.[2] **G03C** *5/30, 1/06*

U.S. Cl. 430—382 **8 Claims**

1. A process of development in which an imagewise exposed light-sensitive color photographic material comprising at least one light-sensitive silver halide emulsion layer is developed with a color developer agent containing a primary aromatic amino group in the presence of a color coupler or color providing compound to form an image dye and in the presence of a thioether compound associated with the material and capable of releasing, on reaction with color developer oxidation products, a diffusible silver halide development inhibitor, wherein the improvement comprises said thioether compound is of the following formula I or of its tautomeric form I a:



(I) (Ia)

wherein

R^1 represents a hydrocarbyl group,

Y represents —S— or —NR^2— wherein R^2 represents hydrogen, a hydrocarbyl group, a heterocyclic group attached through a ring carbon atom, or an electron-attracting substituent, selected from the group consisting of -CN, alkoxycarbonyl, carbamoyl, sulfamoyl, alkylsulfonyl, arylsulfonyl, an acyl group derived from an alkyl carbocyclic acid and aroyl, and

X represents an aliphatic group, an aromatic group, or a 5- or 6-membered heterocyclic aromatic group having at least one nitrogen atom such that when it is split off together with the sulfur atom of the thioether bridge, it forms a diffusible mercapto compound which inhibits development of the silver halide.

4,183,753

PHOTOGRAPHIC PRODUCTS AND PROCESSES EMPLOYING METAL COMPLEXED AZO DYES

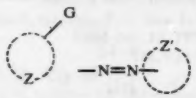
Brian D. Baigrie; Joseph Bailey; Linda G. Johnston, and Miroslav V. Mijovic, all of Harrow, England, assignors to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 822,188, Aug. 5, 1977, Pat. No. 4,142,891. This application Jul. 24, 1978, Ser. No. 927,189

Int. Cl.[2] **G03C** *1/40;* **C09B** *45/00, 45/14;* **C07C** *107/08*

U.S. Cl. 430—17 **19 Claims**

8. A photographic element comprising a support having thereon a layer comprising a photographic mordant and bound thereto a coordination complex of a polyvalent metal ion and a compound having the following formula:



wherein:

Z represents the atoms necessary to complete an aromatic carbocyclic or heterocyclic nucleus having at least one ring of 5 to 7 atoms;

Z′ is an aromatic carbocyclic or heterocyclic nucleus having at least one ring of 5 to 7 atoms, said Z′ having, in a position adjacent to the point of attachment to the azo linkage, either (a) a nitrogen atom in said ring of said nucleus which acts as a chelating site, or (b) a carbon atom in said ring of said nucleus having directly attached thereto a nitrogen atom which acts as a chelating site; and

G is a metal chelating group.

4,183,754

PHOTOGRAPHIC PRODUCTS AND PROCESSES EMPLOYING NONDIFFUSIBLE 1-ARYLAZO-4-ISOQUINOLINOL DYE-RELEASING COMPOUNDS

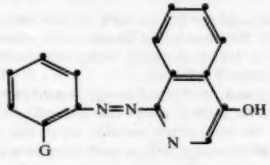
Derek D. Chapman; James A. Friday, both of Rochester, and James Elwood, Victor, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 884,469, Mar. 7, 1978. This application Oct. 10, 1978, Ser. No. 950,194

Int. Cl.[2] **G03C** *1/10;* **C09B** *45/00, 29/22, 29/36*

U.S. Cl. 430—223 **19 Claims**

16. A photographic element comprising a support having thereon a coordination complex of a polyvalent metal ion and a compound having the following formula:



wherein G is a metal chelating group.

4,183,755

PHOTOGRAPHIC PRODUCTS AND PROCESSES EMPLOYING METAL COMPLEXABLE NONDIFFUSIBLE AZO DYE-RELEASING COMPOUNDS

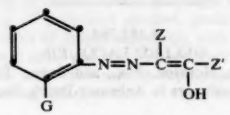
Derek D. Chapman, Rochester, and E-Ming Wu, Webster, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 892,561, Apr. 3, 1978. This application Oct. 10, 1978, Ser. No. 950,193

Int. Cl.[2] G03C 1/40; C09B 45/14

U.S. Cl. 430—213 2 Claims

1. A photographic element comprising a support having thereon a layer comprising a photographic mordant having bound thereto a coordination complex of a polyvalent metal ion and a compound having the following formula:



wherein:

G is a metal chelating group;

Z is an electron withdrawing group having the formula —CON(R)$_2$, —SO_2N(R)$_2$, —COOR, —CN, SO_2R′ or —COR′, wherein R′ is an alkyl group of 1 to 8 carbon atoms or an aryl group of 6 to 10 carbon atoms, and each R is H or R′; and

Z′ is an alkyl group of 1 to 8 carbon atoms, an aryl group of 6 to 10 carbon atoms or N(R)$_2$.

4,183,756

PRE-PRECIPITATION SPECTRAL SENSITIZING DYE ADDITION PROCESS

David J. Locker, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 902,451, May 3, 1978, abandoned. This application Sep. 22, 1978, Ser. No. 944,666

Int. Cl.[2] G03C 1/10, 1/02

U.S. Cl. 430—569 16 Claims

1. In a method of preparing a spectrally sensitized radiation-sensitive silver halide emulsion by a double jet precipitation process in which an aqueous halide salt and an aqueous silver salt are concurrently run into a reaction vessel, the halide salt being at least 50 mole percent chloride, comprising

introducing into the reaction vessel an aqueous dispersing medium,

introducing into the dispersing medium a minor portion of one of the aqueous halide salt and the aqueous silver salt, and

thereafter concurrently introducing into the pAg adjusted dispersing medium in the presence of a peptizer the remainder of the aqueous halide and silver salt solutions,

the improvement comprising

spectrally sensitizing the silver halide emulsion to be prepared by introducing a methine dye into the reaction vessel in an amount sufficient to provide a monolayer coverage of at least about half of the surface area of the silver halide grains to be formed, assuming uniform surface absorption, prior to concurrent introduction of the aqueous halide and silver salt solutions.

4,183,757

TREATMENT OF UNDERWATER SURFACES

Aleksander J. Groszek, London; Colin W. Parkes, Peachey, Nr. Uxbridge, and Denis Windle, Highwycombe, all of England, assignors to The British Petroleum Company Limited, London, England

Continuation of Ser. No. 735,617, Oct. 26, 1976, abandoned, which is a continuation of Ser. No. 556,447, Mar. 7, 1975, abandoned. This application Mar. 8, 1978, Ser. No. 884,399

Claims priority, application United Kingdom, Mar. 13, 1974, 11183/74; Mar. 13, 1974, 11189/74

Int. Cl.[2] C09D 5/08, 5/14

U.S. Cl. 106—14.11 13 Claims

1. In a process for the production of a corrosion and fouling resistant underwater surface which is in continuous contact with water and which has been coated with wax; the improvement comprising applying said wax to said underwater surface as an aqueous dispersion consisting essentially of from 25 to 60% wt. of wax by weight of the dispersion and an emulsifying agent, said aqueous dispersion being a wax in water emulsion having an average wax particle size of from 0.05 to 10 micrometers, the finished wax coating having a thickness of from 5 to 500 micrometers.

4,183,758

ZINC CHROMIUM CHROMATE PIGMENT

Louis Schiffman, 1837 Merritt Rd., Abington, Pa. 19001

Filed Mar. 6, 1978, Ser. No. 883,506

Int. Cl.[2] C09D 5/08; C09C 1/04, 1/34

U.S. Cl. 106—14.05 10 Claims

1. A zinc chromium chromate corrosion inhibiting pigment wherein the mol ratio of zinc oxide to total chromium oxides is about in the range of 5:1 to 1:3 and 5 to 70% of the total chromium content is present in trivalent state.

6. The method of preparing a corrosion-inhibiting pigment powder comprising a complex of zinc and chromium chromate which method comprises interacting zinc oxide with a preformed complex of trivalent and hexavalent chromium, in aqueous solution, drying the obtained reaction product and thereafter grinding the same to a powder.

4,183,759

HARDENABLE COMPOSITIONS

David Epstein, London, England, assignor to The White Sea and Baltic Company Limited, London, England

Continuation-in-part of Ser. No. 675,274, Apr. 9, 1976, Pat. No. 4,106,944. This application Apr. 3, 1978, Ser. No. 892,801

Claims priority, application United Kingdom, Apr. 13, 1977, 15239/77; Apr. 13, 1977, 15240/77; Apr. 13, 1977, 15241/77

Int. Cl.[2] B28B 7/34

U.S. Cl. 106—38.2 14 Claims

1. A method of making a foundry mould or core comprising shaping a mix of a particulate inert refractory material and a binder and allowing the mix to cure in which the binder comprises (a) a water soluble acid component comprising a polymeric carboxylic acid (b) an aluminosilicate glass reactive with the polymeric carboxylic acid to form a cement, (c) water in an amount of below 5% the total weight of the mix and (d) at least one modifier selected from the group consisting of tartaric acid and phosphoric acid, each modifier being present in an amount of at least 25% by weight based on the weight of polymeric carboxylic acid.

13. In a hardenable foundry composition that can be formed into the shape of a foundry core or mould and hardened, comprising an inert particulate refractory material selected from refractory oxides and silicates and binder ingredients that react to form a cured binder that hardens the composition, the improvement which consists of the use as binder ingredients of a particulate aluminosilicate glass and an aqueous solution of a polymer of acrylic acid that will leach cations from the glass to form the reacted binders, and in which the amount of the said binder ingredients is from 1 to 10% by weight of the composi-

tion and in which the binder ingredients include also particulate fused magnesia in an amount of at least 50% by weight based on the weight of polymeric carboxylic acid.

4,183,760

HIGH-STRENGTH ALUMINA CERAMIC PRODUCT AND METHOD OF FORMING

James E. Funk, Alfred, and Ira O. Knickerbocker, Victor, both of NY, assignors to Electric Power Research Institute, Inc., Palo Alto, Calif.

Filed Nov. 18, 1977, Ser. No. 852,693
Int. Cl.[2] C04B *33/26, 33/24, 35/10*
U.S. Cl. 106—46 **8 Claims**

1. The method of producing a high-strength ceramic body comprising the steps of comminuting alumina to break up essentially all agglomerates in excess of 20 microns, mixing said comminuted alumina, clay, and flux with water in sufficient quantity to form a plastic extrudable aqueous mass, said alumina comprising from about 45 to about 60% by weight of solids content of the mass, extruding said aqueous mass into the desired configuration, and drying and firing the mass to form a ceramic body.

4,183,761

SILICA BRICKS AND METHOD FOR MANUFACTURING SILICA BRICKS

Yoshiaki Hoshino; Tokuaki Hatta, and Masahiro Sakai, all of Kitakyushu, Japan, assignors to Kurosaki Refractories Co., Ltd., Kitakyushu, Japan

Filed Aug. 16, 1978, Ser. No. 934,128
Claims priority, application Japan, Sep. 10, 1977, 52/109248
Int. Cl.[2] C04B *35/14, 35/56, 35/58*
U.S. Cl. 106—69 **4 Claims**

1. A method for manufacturing silica bricks characterized in that 0.5 to 10% by weight of a silicon compound selected from the group consisting of silicon nitride, silicon carbide and mixtures thereof is added to silica to form a mixture and, in the firing process, said mixture is fired with a firing condition from 1200° C. to 1400° C. which falls in a region above line ABC shown in FIG. 1.

4,183,762

METHOD FOR MULTI-STEP CALCINATION OF CEMENT CLINKER

Herbert Deussner, Bergisch Gladbach, Fed. Rep. of Germany, assignor to Klöckner-Humboldt Deutz Aktiengesellschaft, Fed. Rep. of Germany

Filed Mar. 21, 1978, Ser. No. 888,696
Claims priority, application Fed. Rep. of Germany, Mar. 21, 1977, 2712238
Int. Cl.[2] C04B *7/44*
U.S. Cl. 106—100 **6 Claims**

1. A method for the production of cement to the clinker stage from raw material comprising the steps:

preheating the raw material in a preheating step;

calcining the preheated raw material in two heating stages which comprise:

precalcining the material wherein heat is supplied solely by exhaust gases received from a sintering step, and

after-calcining the material wherein heat is supplied by the combustion of fuel supported by air;

passing the calcined material to said sintering step in order to form clinker; and

cooling the clinker.

4,183,763

GYPSUM-BASED GRANULES AND METHOD OF PRODUCTION

Barry A. Omilinsky, Morton Grove, and Fredrick E. Wolatz, Brookfield, both of Ill., assignors to Oil-Dri Corporation of America, Chicago, Ill.

Filed Dec. 27, 1977, Ser. No. 864,822
Int. Cl.[2] C04B *11/00*
U.S. Cl. 106—109 **5 Claims**

1. A gypsum-containing macrogranule which comprises an agglomerate of a plurality of relatively smaller, gypsum-containing granules that are surface-bonded to one another in a discrete cluster having a bulk density that is at least about 5 percent less than said gypsum-containing granules and an average diameter that is at least about twice the average diameter of a majority of said gypsum-containing granules.

4,183,764

GELLED LACQUER

James M. Lucas, Houston, Tex., and James Teng, St. Louis County, Mo., assignors to Anheuser-Busch, Incorporated, St. Louis, Mo.

Filed Sep. 1, 1977, Ser. No. 829,618
Int. Cl.[2] C08L *1/18, 1/32*
U.S. Cl. 106—178 **4 Claims**

1. A composition for coating a substrate, said composition comprising nitrocellulose resin, and organic solvent, and plasticizer, the weight ratio of plasticizer to nitrocellulose resin being about 1 to about 4 and said nitrocellulose resin being present in amounts of about 12.6% to about 8.4% by weight based on the combined weight of resin, plasticizer and solvent, said composition also including hydroxyproplycellulose acetate having a degree of substitution of acetyl groups from about 1.0 to about 2.0 and a degree of molecular substitution of hydroxypropyl groups from about 3.5 to about 4.5, said hydroxypropylcellulose acetate being present in about 0.05 to about 0.25% by weight of the combined weight of resin, plasticizer and solvent sufficient to provide a viscosity substantially the same as a conventional composition having a greater amount of nitrocellulose resin content without the hydroxypropylcellulose acetate, whereby when the composition is applied as a coating to a paper substrate, the so-coated substrate exhibits greater break strength than when coated with such conventional composition.

4,183,765

METHOD OF INCREASING VISCOSITY OF HYDROXYALKYL CELLULOSE SOLUTIONS

Thomas J. Podlas, Newark, Del., assignor to Hercules Incorporated, Wilmington, Del.

Filed Jul. 14, 1978, Ser. No. 925,005
Int. Cl.[2] C08L *1/26*
U.S. Cl. 106—187 **4 Claims**

1. A method of increasing the viscosity of an aqueous solution of a hydroxyalkyl ether of cellulose which comprises contacting a solution containing at least about 0.075% by weight of said ether with about 0.4 to 75% by weight, based on the ether, of benzoquinone, said solution having a pH greater than 6.4 after addition of the benzoquinone and having sufficient buffering capacity to retain a pH greater than 6.4 for at least 24 hours following addition of benzoquinone thereto.

4,183,766

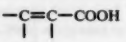
PAPER COATING COMPOSITION

Fred E. Woodward, 200 Churchill Rd., West Palm Beach, Fla. 33405

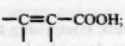
Filed Jun. 12, 1978, Ser. No. 910,001
Int. Cl.[2] C08L *3/02, 29/02*
U.S. Cl. 106—213 **13 Claims**

1. A composition for coating paper and suitable for producing a paper surface which can be polished (calendered) to a higher level of gloss consisting essentially of; (A) 100 parts of

a uniformly fine mesh kaolin clay pigment of paper coating grade having less than 0.05% particles greater than 325 mesh; (B) 5 to 30 parts of a binder taken from the group consisting of (a) 0 to 30 parts starch, oxidized starch, enzyme converted starch, hydroxyethylated starch, hydroxypropylated starch, and starch derivatives (b) from 0 to 14 parts of a synthetic latex binder taken from the group consisting of polymers and copolymers of styrene, butadiene, ethylene, propylene, vinylacetate, esters of acrylic and methacrylic acid and copolymers and terpolymers of these monomers with vinyl carboxylic acids having the structure



(c) 0 to 10 parts of water soluble polymers taken from the group consisting of polyvinyl alcohol, protein, hydrolyzed protein, copolymers of maleic anhydride with butadiene, styrene, methyl vinyl ether and ethylene, polyacrylic acid, polymethacrylic acid; and water soluble copolymers of vinyl carboxylic acids having the structure



(C) from 0.3 to 20 parts of a gloss improver taken from the group comprising phosphate esters of aliphatic alcohols of carbon number 16 to 26; and uniformly dispersed in 35 to 95% water.

4,183,767

LIGHT DIFFUSING OR SPECTRAL COATING FOR PRINTED CIRCUIT BOARDS AND THE LIKE

Stanley Kessler, 9317 Mary Knoll, Whittier, Calif. 90605

Continuation of Ser. No. 717,497, Aug. 25, 1976, abandoned.
This application Sep. 20, 1978, Ser. No. 944,190
Int. Cl.[2] C08J *3/02*
U.S. Cl. 106—236 **7 Claims**

1. A composition of matter suitable for application as an optical coating to the surfaces of printed circuit boards and assemblies, comprising:
a high-melting point rosin,
dimethyl sulfoxiue, the weight of the rosin being at least one-half the weight of the dimethyl sulfoxide, and
a solvent carrier.

4,183,768

ANATASE PIGMENT FROM ILMENITE

Donald E. Knapp, and Gerard M. Sheehan, both of Savannah, Ga., assignors to American Cyanamid Company, Stamford, Conn.

Filed Mar. 3, 1975, Ser. No. 554,796
Int. Cl.[2] C09C *1/36*
U.S. Cl. 106—299 **4 Claims**

1. A titanium dioxide pigment of anatase crystal structure containing 0.05 to 0.3% Nb_2O_5, 0.4 to 0.6% K_2O, 0.8 to 1.2% Sb_2O_3, 0.2 to 0.4% P_2O_5, and the balance substantially TiO_2; the particles of said pigment having a surface coating of hydrous metal oxide.

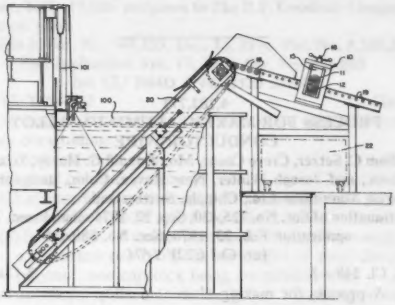
4,183,769

METHODS AND APPARATUS FOR GLASS REMOVAL

James C. Ailor, Kokomo, Ind., assignor to Cabot Corporation, Kokomo, Ind.

Filed Sep. 12, 1977, Ser. No. 832,220
Int. Cl.[2] B08B *7/00*
U.S. Cl. 134—6 **7 Claims**

1. An apparatus for removing glass from metal surfaces and the like such as glass coated rods comprising a pair of spaced apart rolls forming a pass line therebetween, one of said rolls being a resilient roll, the other of said rolls being a toothed hard roll having a multiplicity of relatively sharp pointed teeth closely spaced about the periphery of roll and extending from the body of the roll as an array of discrete points adapted to engage and break up the glass on the metal surfaces, means for adjusting said rolls relative to one another to vary the opening therebetween to provide a gap substantially equal to the thickness of the metal being cleaned and from which the glass is being removed and drive means rotating at least one of said rolls to move the metal article from which glass is to be removed through between the rolls.



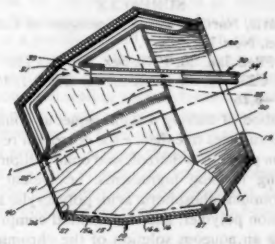
5. The method of removing glass from metal surfaces comprising the steps of:
(a) providing a pair of spaced apart rolls, one of which is a toothed hard roller and the other a cooperating resilient roller forming between them a pass line whose nip is substantially equal to the thickness of the metal being cleaned,
(b) driving said rolls for rotation; and
(c) passing the glass coated metal between the rolls to cause the toothed roll to break up the glass on the metal surfaces.

4,183,770

APPARATUS AND PROCESS FOR CLEANING FILLED CAPSULES

Lloyd A. Quick, Brockville, Canada, assignor to Warner-Lambert Company, Morris Plains, N.J.

Filed May 24, 1978, Ser. No. 909,322
Int. Cl.[2] B08B *1/04*
U.S. Cl. 134—6 **4 Claims**



4. Process for cleaning filled capsules, comprising the steps of
rubbing particulate matter from the surface of the capsules by tumbling a batch of the same in a rotary drum coating pan adapted for tumbling the capsules, and having lower, middle and upper walls and a base, the inner surface of the upper wall and the base being unlined, the inner surface of the lower wall and the middle wall of the coating pan

being lined with napped or tufted fabric having anti-static properties such that uncleaned capsules during tumbling are rubbed by the nap of the fabric whereby the exterior surface of each capsule is cleaned of particulate matter by such rubbing action, and cleaning the unlined pan surface and the nap of the fabric during tumbling by vacuum cleaning means including a wand nozzle contoured to fit closely against the inner surface of each of the lower, middle and upper walls and the base, the wand face including brush means operative to wipe the inner surface of the upper wall and the base during tumbling.

4,183,771

PROCESS FOR MAKING ALUMINUM ALLOY CONDUCTOR WIRE

William C. Setzer, Creve Coeur, Mo.; Ronald G. Hardy, Hixson, Tenn., and Joseph Winter, New Haven, Conn., assignors to Swiss Aluminium Ltd., Chippis, Switzerland

Continuation of Ser. No. 725,430, Sep. 22, 1976, abandoned. This application Feb. 23, 1978, Ser. No. 880,415

Int. Cl.[2] C22F *1/04*

U.S. Cl. 148—2 **5 Claims**

1. A process for making aluminum alloy conductor wire consisting essentially of the steps:

(a) providing an aluminum alloy consisting essentially of from 0.04 to 1.0% by weight iron, from 0.02 to 0.2% by weight silicon, from 0.1 to 1.0% by weight copper, from 0.001 to 0.2% by weight boron, balance aluminum;

(b) casting and filtering said alloy into billet or bar form;

(c) deforming said billet or bar to form redraw rod without reheating at a starting temperature of at least approximately 900° F.; p1 (d) cold deforming said redraw rod to final gage at a diameter of between 0.002 and 0.5 inch; and

(e) finally annealing said cold deformed rod at final gage for a period of time and at a temperature sufficient to form wire having an electrical conductivity of at least 60% IACS in addition to a combination of high strength, excellent ductility and good connection characteristics.

4,183,772

COMPOSITION AND METHOD FOR COATING METAL SURFACES

James W. Davis, North Wales, Pa., assignor to Union Carbide Corporation, New York, N.Y.

Filed Jan. 30, 1978, Ser. No. 873,251

Int. Cl.[2] C23F *11/04*; C09K *15/32*; B05D *1/38, 7/14*

U.S. Cl. 148—6.16 **13 Claims**

1. The method of making a stable aqueous composition for coating metal surfaces to enhance the corrosion resistance and paint adhesion properties thereof, said composition containing, as the coating forming ingredients: hexavalent chromium, trivalent chromium, phosphoric acid, polyacrylic acid, and an acrylic emulsion polymer, and said method comprising:

(1) forming an aqueous solution of the chromium trioxide and the phosphoric acid;

(2) reducing about 40 to 60% of the hexavalent chromium to trivalent chromium under conditions adapted to completely dissolve all of the reaction products;

(3) adding the polyacrylic acid to the partially reduced chromium solution under conditions adapted to insure complete interaction of the reactants present; and

(4) adding the acrylic emulsion polymer to the partially reduced chromium polyacrylic acid solution.

4,183,773

CONTINUOUS ANNEALING PROCESS FOR STRIP COILS

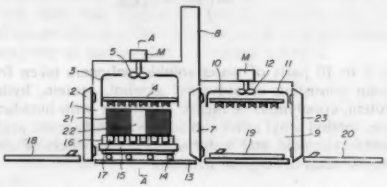
Yoshiaki Kawasoko, Chigasaki; Iwane Chiba, Soka; Noboru Yamazaki; Toshimi Chiyonobu, both of Fukuyama, and Masao Shikuma, Kamakura, all of Japan, assignors to Nippon Kakan Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 753,907, Dec. 23, 1976, abandoned. This application Jun. 1, 1978, Ser. No. 911,692

Claims priority, application Japan, Dec. 25, 1975, 50-153930

Int. Cl.[2] C21D *1/74*

U.S. Cl. 148—16 **2 Claims**



1. An annealing process, comprising the steps of

(a) opening a charging door of a heating chamber;

(b) charging one or more strip coils mounted on a vehicle into the heating chamber;

(c) closing said charging door;

(d) purging from the heating chamber, O_2 which has entered together with the coils, with N_2 to decrease it to less than 10 ppm;

(e) under the condition that O_2 within the closed heating chamber is less than 10 ppm, heating the strip coil on the vehicle while replacing N_2 with an atmospheric gas of H_2N_2;

(f) purging from a cooling chamber O_2 which has entered thereinto when a discharging door is opened, with N_2 to decrease it to less than 2 ppm, and introducing H_2N_2 into the cooling chamber to provide the same atmosphere as in the heating chamber; and

(g) opening a communicating door between the heating chamber and the cooling chamber to charge the heated strip coils into the cooling chamber, and closing the communicating door and starting cooling treatment.

4,183,774

HIGH-ENDURANCE SUPERALLOY FOR USE IN PARTICULAR IN THE NUCLEAR INDUSTRY

Alain L. C. Balleret, 14 rue Auguste Neveu, 92500 Rueil-Malmaison, France, assignor to Commissariat a l'Energie Atomique, Paris, France and Alain L. C. Balleret, Rueil-Malmaison, France

Filed Apr. 4, 1977, Ser. No. 784,309

Claims priority, application France, Apr. 2, 1976, 76 09626

Int. Cl.[2] C22C *38/44*

U.S. Cl. 148—31 **10 Claims**

1. A high-endurance alloy which illustrates a high degree of hardness both in the cold state and in the hot state, resistance to chemical corrosion and excellent friction behavior in the cold state and in the hot state, which alloy comprises carbides

of the M7 C3 and M6 C type, which consists essentially of by weight 0.2 to 1.9% carbon, 18 to 32% chromium, 1.5 to 8% tungsten, 15 to 40% nickel, 6 to 12% molybdenum, 0.1 to 3% niobium-tantalum, 0.1 to 2% silicon, 0.1 to 3% manganese, 0.1 to 3% zirconium, 0.1 to 3% vanadium, less than 0.3% cobalt and a quantity of iron such as to ensure overall balance of said alloy.

4,183,775

EXPLOSIVE CONTAINING POLYVINYL CHLORIDE AND ALUMINUM AS SENSITIZER

Charles M. Lownds, Johannesburg, and Nigel A. Healy, Edenvale, both of South Africa, assignors to AECI Limited, Johannesburg, South Africa

Filed Oct. 10, 1978, Ser. No. 950,143

Claims priority, application South Africa, Oct. 14, 1977, 77/6117

Int. Cl.[2] C06B *45/02*

U.S. Cl. 149—21 **7 Claims**

1. A slurry explosive composition comprising at least one inorganic salt, a liquid solvent, disperser or carrier for said salt, and particulate fuel comprising flake aluminium and polyvinyl chloride, said flake aluminium and polyvinyl chloride having a synergistic sensitising action.

4,183,776

TENNIS RACKET MANUFACTURE

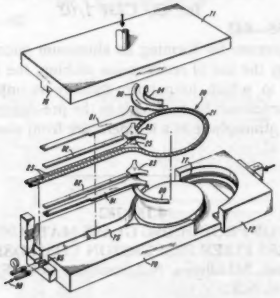
Anthony F. Staub; Norman T. Staub, both of Dayton, Ohio, and John R. Erwin, Paradise Valley, Ariz., assignors to Starwin Industries, Inc., Dayton, Ohio

Division of Ser. No. 480,462, Jun. 18, 1974, Pat. No. 4,045,025, which is a continuation-in-part of Ser. No. 332,130, Feb. 13, 1973, abandoned, which is a division of Ser. No. 107,304, Jan. 18, 1971, Pat. No. 3,755,037. This application Aug. 25, 1977, Ser. No. 827,670

The portion of the term of this patent subsequent to Aug. 28, 1990, has been disclaimed.

Int. Cl.[2] B65H *81/00*; A63B *49/10*

U.S. Cl. 156—156 **4 Claims**



1. The method of making a racket frame comprising the steps of:

(a) substantially filling an elastomeric tube at least as long as the peripheral outline of the frame with a removable core to form a mandrel,

(b) supporting the resulting mandrel in straight position,

(c) forming a tubular shell on said mandrel by successively applying thereto a plurality of individual layers of high tensile strength fiber impregnated with binder,

(d) removing said core from within said tube,

(e) placing said shell with said tube therein in a mold cavity defining a racket shape,

(f) forming aligned pairs of holes for strings in opposite sides of said shell by separating the fibers in said fiber layers at predetermined opposed positions along the head defining portion of said shell without perforating said tube,

(g) applying fluid pressure to said tube to press said shell into uniform contact with said mold cavity, and

(h) hardening said binder while maintaining said pressure supplying step and said holes in said shell.

4,183,777

METHOD OF MAKING WEATHER RESISTANT COMPOSITES

James W. Summers, Bay Village, and George J. Kliner, Avon Lake, both of Ohio, assignors to The B.F. Goodrich Company, Akron, Ohio

Division of Ser. No. 749,939, Dec. 13, 1976, Pat. No. 4,100,325. This application Apr. 17, 1978, Ser. No. 896,843

Int. Cl.[2] B44D *1/44*; B32B *27/08*

U.S. Cl. 156—243 **2 Claims**

1. A method for producing a weatherable composite comprising coextruding:

a. a capstock containing:

(1) vinyl chloride polymer,

(2) at least 6 parts by weight of titanium dioxide per 100 parts by weight of vinyl chloride polymer,

(3) from about 10 to less than about 35 parts by weight of a plasticizer per 100 parts by weight of vinyl chloride polymer, said capstock being coextruded with

b. a substrate selected from the group consisting of rigid vinyl chloride polymers, chlorinated vinyl chloride polymers, and acrylonitrile-butadiene-styrene polymers.

4,183,778

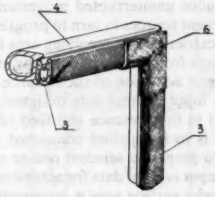
METHOD OF MAKING SEALING STRIP JOINT

Francois Mesnel, Neuilly-sur-Seine, France, assignor to Etablissements Mesnel, Carrieres-sur-Seine, France

Filed Nov. 14, 1977, Ser. No. 851,255

Int. Cl.[2] B29C *19/00*; B32B *31/00*; B29C *19/00*; B29H *7/04*

U.S. Cl. 156—245 **11 Claims**



1. A process for joining two lengths of elongated sealing strips, for use for example on a vehicle body, in an end-to-end relationship at a predetermined angle, each composite sealing strip comprising: (a) an elongated gripping portion to be mounted on said body formed of a compact plastic material, and (b) an elongated sealing portion formed of cellular plastic material, said portions extending and connected together in the lengthwise direction to form said composite sealing strips, wherein said process comprises the steps of:

(1) cutting the ends of said strip lengths crosswise at equal angles for producing the predetermined desired angle when said ends face one another in an end-to-end relationship,

(1a) coating the faces of said ends of said sealing portions with a vulcanizable elastomeric solution,

(2) placing said lengths end-to-end and facing said ends with like material portions in alignment in a single mold with said compact plastic material portion in substantially one section of said mold and said cellular plastic material sealing portion in substantially another section of said mold,

(3) injecting plastic material over at least two of said aligned and like portions at the ends thereof and between the ends

thereof to weld said strip lengths together in one single operation,

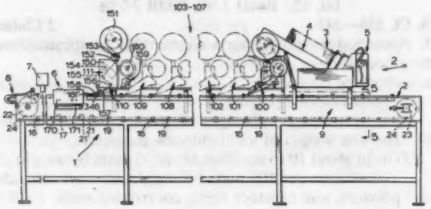
(4) allowing said injected plastic material to set, thereby forming a juncture between said strip lengths and a reinforcing gusset thereover.

4,183,779

AUTOMATIC INDICIA APPLYING MACHINE

Donald T. Barber, Toronto, Canada, and Dale L. Anderson, Mound, Minn., assignors to Datafile Limited, Willowdale, Canada

Filed Sep. 2, 1977, Ser. No. 830,118
Int. Cl.[2] B32B *31/00*
U.S. Cl. 156—361 **63 Claims**



1. Apparatus for automatically applying to a carrier surface a plurality of indicia constituents arranged at predetermined positions and in predetermined order on such surface to prsent a predetermined indicia display according to a predetermined scheme, said apparatus comprising a plurality of indicia constituent sources each adapted upon actuation to apply its indicia constituent to a moving surface when prepared for actuation by input data, one source for each indicia constituent to be called for by said scheme, a transport system for transporting a carrier, to an area of the surface of which indicia is to be applied, in continuous uninterrupted movement past each of said indicia constituent sources in turn to progressively present thereto the entire carrier indicia receiving area for the application thereto of indicia from such source at any and all positions within said area upon actuation of such source, and a control unit responsive to input control data designating the desired indicia display and to the presence and feed of the carrier to which the indicia is to be applied connected to said indicia applying sources to prepare a selected one or ones thereof as called for by said input control data for actuation as the continuously moving carrier surface area is progressively presented thereto and means responsive to movement of said transport system to actuate the prepared selected one or ones of said indicia applying sources to apply the respective indicia constituent to the carrier surface at any or all of said positions as called for by said input control data.

4,183,780

PHOTON ENHANCED REACTIVE ION ETCHING

Charles M. McKenna, Fishkill, and H. Keith Willcox, Poughkeepsie, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 21, 1978, Ser. No. 934,733
Int. Cl.[2] H01L *21/306*; C03C *15/00, 25/06*
U.S. Cl. 156—643 **15 Claims**

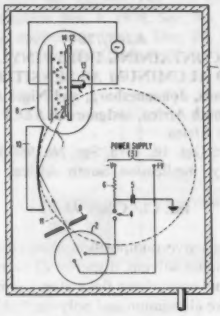
1. A method for modifying a surface by either etching the surface or depositing a layer thereon which comprises the steps of, in either order, creating a plasma of reactive gas, and exposing a gas to vacuum ultraviolet of an energy such that the gas will be disassociated and of an intensity sufficient to disassociate the gas in sufficient quantity to permit control of the modification of the surface.

11. An apparatus for modifying a surface by either etching the surface or depositing a layer thereon, comprising:

source means for generating vacuum ultraviolet radiation;

monochromator means for tuning the radiation to a predetermined energy;

plasma reactor means adapted to modify the surface of articles with a plasma and having a supply chamber of gas for the plasma; and



means for directing the tuned radiation to expose at least a portion of the gas, said radiation having an energy overlapping the disassociation energy of the gas, whereby the gas disassociates into reactive species thereby permitting real time control of the modification of the surface.

4,183,781

STABILIZATION PROCESS FOR ALUMINUM MICROCIRCUITS WHICH HAVE BEEN REACTIVE-ION ETCHED

Jerome M. Eldridge, Saratoga; Wen-yaung Lee, San Jose, both of Calif., and Geraldine C. Schwartz, Poughkeepsie, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 25, 1978, Ser. No. 945,164
Int. Cl.[2] C23F *1/02*
U.S. Cl. 156—643 **4 Claims**

1. In a process for forming an aluminum microcircuit on a substrate by the use of reactive-ion etching, the improvement according to which long term stability is imparted to the etched microcircuit by heating it in the presence of an oxygen containing atmosphere at a temperature from about 200° C. to about 450° C.

4,183,782

METHOD OF PRODUCING GLASS MATS USING NOVEL GLASS FIBER DISPERSION COMPOSITION

A. A. Bondoc, MIddlesex, N.J., assignor to GAF Corporation, New York, N.Y.

Filed Jul. 11, 1978, Ser. No. 923,553
Int. Cl.[2] D21H *5/18*
U.S. Cl. 162—156 **9 Claims**

1. A method of producing uniform, high-strength glass mats which comprises:

a. dispersing a plurality of glass fibers bundles in an aqueous dispersion comprising an effective amount of an amine oxide surfactant and a derivatized guar gum which is at least about 5 ppm of said amine oxide and at least about 0.05 percent of said guar gum by weight of the aqueous dispersion containing said glass fibers to substantially filamentize said bundles and uniformly disperse the fibers;

b. passing said dispersion through a mat-forming screen to form said glass mat while removing said aqueous system therefrom, and;

c. recovering said glass mat.

4,183,783
SEMISYNTHETIC PAPER STRUCTURE ON A UREA BASIS

Olof Sundén, Snickarvägen 22, 181 46 Lidingö, Sweden, and Birgitta Sundén, Lidingö, Sweden, assignors to Olof Sundén, Lidingö, Sweden

Filed Sep. 21, 1977, Ser. No. 835,342
Claims priority, application Sweden, Sep. 21, 1976, 7610444
Int. Cl.² D21H *3/54*
U.S. Cl. 162—166 **11 Claims**

1. Method of producing a semisynthetic paper of low bulk, comprising the steps of:

foaming a solution of urea-formaldehyde condensate;

precuring said foamed solution at a temperature between 5° and 60° C. to form a solid, non-tacky foam;

disintegrating said foam into particles having a major dimension of 100 to 1000 μm;

forming a stock from said particles and cellulosic vegetable fibres having a pH between 3 and 7;

including in said stock a water-insoluble latent heat-sensitive acidifier;

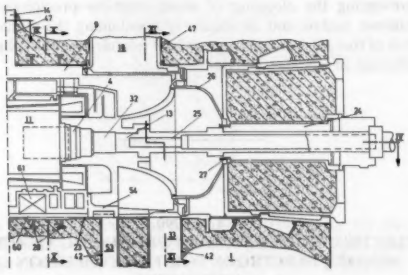
forming a paper web from said stock; and

drying said paper web at a temperature between 80° and 140° C., said latent acidifier being thereby activated for shifting the pH of said web to a pH between 1.5 and 4.5 such that said particles in said web are cured a second time under the formation of a continuous, chemically bonded fibre network structure of said particles and said fibres.

4,183,784
NUCLEAR REACTOR PLANT WITH CLOSED GAS COOLANT CIRCUIT

Dirk Haferkamp; Alija Hodzic, both of Mannheim, Fed. Rep. of Germany; Paul Moser, Dietlikon, Switzerland, and Dieter Prasch, Frankental, Fed. Rep. of Germany, assignors to Hochtemperatur-Reaktorbau GmbH, Cologne, Fed. Rep. of Germany and BBC Aktiengesellschaft Brown, Bovery & Cie., Baden, Switzerland

Filed Aug. 16, 1977, Ser. No. 825,545
Claims priority, application Fed. Rep. of Germany, Aug. 18, 1976, 2637166
Int. Cl.² G21C *19/28*
U.S. Cl. 176—60 **13 Claims**



1. A nuclear reactor plant, comprising:

a prestressed concrete pressure vessel;

a high temperature reactor arranged in a first central cavity within said vessel;

a closed gas cooling circuit including at least one housed gas turbo unit arranged in a turbine duct in the wall of said vessel, said unit including a turbine and a compressor and having detachable bearings; means for exchanging heat and means for transporting gas in said cooling circuit including hot gas from said reactor to said turbine, said heat exchange means and said gas transport means being arranged in recesses in the wall of said vessel;

means for forming a detachable plug-in type connection between said hot gas transport means and each said turbo unit;

means, positioned at the edge of the turbine duct, for connecting all remaining gas transport means to said turbo unit;

means, including peripheral sealing members positioned between the inside wall of the turbine duct and the outer housing of said turbo unit, for separating each of said remaining gas transport means from each other;

means for detachably connecting each said turbo unit to the inside of its turbine duct;

remote control means for detaching said connecting means;

means, including at least one lifting device controllable from outside of said vessel through a bore in the wall of said vessel, for dismounting each said turbo unit from within its turbine duct;

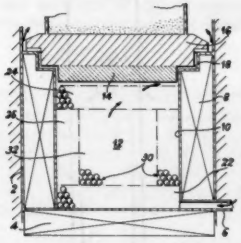
means for detaching from outside of said vessel all connections to each said turbo unit which must be removed in order for removal of said turbo unit from its turbine duct; and

means, including a duct through the wall of said vessel, for gaining access to each bearing of each turbo unit.

4,183,785
METHOD FOR POSITIONING MODERATOR STRUCTURE FOR THE CORE OF A MOLTEN-SALT REACTOR

Jacques M. Blum, Levallois Perret, and Edmond Ventre, Le Vesinet, both of France, assignors to Electricite de France (Service National) Pechiney Ugine-Kuhlmann, Paris, France

Division of Ser. No. 697,153, Jun. 17, 1976, Pat. No. 4,102,740.
This application Jan. 24, 1978, Ser. No. 871,998
Claims priority, application France, Jun. 26, 1975, 75 20118; Oct. 9, 1975, 75 30981
Int. Cl.² G21C *5/00*
U.S. Cl. 176—84 **16 Claims**



1. A method for positioning and extracting a moderator structure made of separate spherical moderator elements and also nodules in and from a nuclear reactor of the molten salt type, said method comprising positioning operations and extracting operations, wherein the positioning operations include the steps of:

(a) defining a core region of the nuclear reactor by a bottom wall and a lateral reflector,

(b) feeding in bulk a quantity of said spherical nodules required for completely filing said core region and obtaining said moderator structure consisting in a stock of separate nodules applied in mutual contact in the three dimensions of the space and a lattice of interstices in said stock,

(c) placing a top wall for closing said core region, and

(d) introducing into said core region, said molten salt, the extracting operations including the steps of:

(e) removing the top wall, and

(f) extracting said nodules by way of a handling device.

4,183,786

PROCESS FOR PRODUCTION OF L-SERINE

Kiyoshi Nakayama, Sagamihara; Kazumi Araki, and Yoshitake Tanaka, both of Machida, all of Japan, assignors to Kyowa Hakko Kogyo Co., Ltd., Japan

Filed Nov. 28, 1977, Ser. No. 855,328

Claims priority, application Japan, Nov. 30, 1976, 51-143748; Dec. 8, 1976, 51-147389; Dec. 8, 1976, 51-147390; Dec. 20, 1976, 51-153024

Int. Cl.[2] C12D *13/06*

U.S. Cl. 435—116 11 Claims

1. A process for producing L-serine which comprises converting glycine to L-serine in an aqueous medium containing glycine in the presence of microbial cells of a mutant belonging to the species *Nocardia butanica* and capable of converting glycine to L-serine, and having a resistance to at least one metabolic antagonist selected from those of glycine, serine, methionine, glutamine, histidine, leucine, isoleucine, valine, purine, pyrimidine or folic acid, accumulating L-serine in the medium, and recovering L-serine therefrom.

4,183,787

CIRCULATION OF GAS/LIQUID MIXTURES

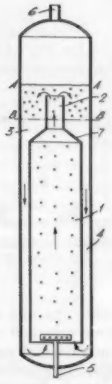
Frank C. Roesler; David A. Hines; Frank P. Maslen, and Richard Fawcett, all of Stockton-on-Tees, England, assignors to Imperial Chemical Industries Limited, London, England

Continuation of Ser. No. 636,612, Dec. 1, 1975, abandoned. This application Oct. 25, 1977, Ser. No. 845,410

Claims priority, application United Kingdom, Dec. 4, 1974, 52430/74

Int. Cl.[2] C12B *1/14, 1/16*

U.S. Cl. 435—43 4 Claims



1. A method for circulating a mixture comprising a liquid and a gas which comprises the steps of continuously circulating the mixture around a system comprising a riser communicating at its lower end with the lower end of a downcomer and at its upper end communicating through a gas disengagement section with the upper end of the downcomer, the riser having an upper section and a lower section, the lower section being of greater cross-sectional area than the upper section, injecting a gas into the liquid in the lower section of the riser and disengaging a substantial portion of the gas injected into the liquid from downwardly flowing liquid in the gas disengagement section, in which section the liquid flows downwardly at a velocity which does not exceed 0.2 meters per second.

4,183,788

PROCESS FOR GRAINING AN ALUMINUM BASE LITHOGRAPHIC PLATE AND ARTICLE THEREOF

Howard A. Fromson, 15 Rogues Ridge Rd., Weston, Conn. 06880, and Robert F. Gracia, Scituate, Mass., assignors to Howard A. Fromson, Weston, Conn.

Filed Feb. 28, 1978, Ser. No. 881,991

Int. Cl.[2] B41N *3/04;* G03C *1/94*

U.S. Cl. 430—278 14 Claims

1. Process for making a lithographic printing plate comprising an aluminum base which comprises graining said aluminum base with an aqueous slurry comprising unfused, platy crystalline alumina while applying a rotary brushing motion whose force vector is predominantly tangential to the surface of the aluminum.

4,183,789

ANODE BAG BENEFACTION

Hyman Chessin, West Bloomfield, and Edgar J. Seyb, Jr., Berkley, both of Mich., assignors to M&T Chemicals Inc., Stamford, Conn.

Continuation of Ser. No. 782,899, Mar. 30, 1977, abandoned. This application Jul. 20, 1978, Ser. No. 926,432

Int. Cl.[2] C25D *3/12, 3/56*

U.S. Cl. 204—43 T 6 Claims

1. A process for the prevention of anode bag clogging in the preparation of an electrodeposit which contains nickel or; binary or ternary alloys of the metals selected from nickel, iron and cobalt; which comprises passing current from an anode to a cathode through an aqueous acidic electroplating solution containing nickel compounds and which may additionally contain iron compounds providing nickel and iron ions for electrodepositing nickel, cobalt, nickel-cobalt alloys, nickel-iron alloys, cobalt-iron alloys or nickel-iron-cobalt alloys and containing an amount of oxalic acid break-down product; the improvement comprising the presence of 2×10^{-3} mole per liter to 1.0 mole per liter of a calcium compound thereby preventing the clogging of anode bags by precipitation of calcium oxalate and subsequently maintaining the concentration of free calcium ion in an amount greater than the solubility constant of calcium oxalate.

4,183,790

ELECTROLYTIC METHOD OF PRODUCING AN ACTIVE COBALT ELECTRODE FOR THE EVOLUTION OF HYDROGEN

Mohammad B. I. Janjua, Pincourt, and Rodney L. LeRoy, Pointe Claire, both of Canada, assignors to Noranda Mines Limited and The Electrolyser Corporation Ltd., both of Toronto, Canada

Filed May 26, 1978, Ser. No. 909,727

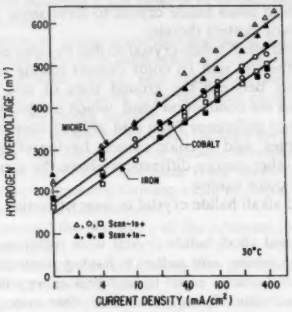
Claims priority, application Canada, Jul. 22, 1977, 283384

Int. Cl.[2] C25B *11/04;* C25D *3/12, 5/50*

U.S. Cl. 204—48 18 Claims

1. A method of producing a cobalt plated electrode having a low overvoltage for the evolution of hydrogen from aqueous electrolytes comprising subjecting an electrically conductive substrate to electrolyte plating at a current density in the range of 0.2 to 150 mA/cm^2 in an aqueous bath containing cobalt ions and a reducing agent selected from the group consisting of

hypophosphite salts, phosphite salts, formaldehyde and hydrazine in the concentration of 2 to 100 gpl said aqueous bath

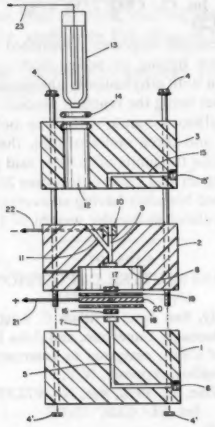


having a pH in the range of 3 to 10 and being maintained at a temperature between 20° and 80° C.

4,183,791
METHOD OF FORMING AMPEROMETRIC SENSOR WITH TRANSITION METAL OXIDE/HYDROXIDE ELECTRODES

Karl G. Schick, 5050 N. 19th St., Milwaukee, Wis. 53209, and Calvin O. Huber, 707 W. Pioneer Rd., Mequon, Wis. 53092

Filed Apr. 20, 1978, Ser. No. 898,516
Int. Cl.² C25D *9/06*
U.S. Cl. 204—56 R **7 Claims**



1. A process for preparing an amperometric sensor for use in determining organic polyhydroxy, polyamine, thio and hydrogen peroxide compounds by liquid chromatography and high pressure liquid chromatography comprising

immersing a metallic substrate of a transition metal selected of a multivalent transition metal of the periods 4, 5 and 6 of the periodic table,

immersing the metallic substrate in an aqueous solution having a pH within the range of 10 to 14 and containing transition metal ions in a concentration within the range of 10^{-3} to 10^{-6} mole per liter.

connecting the metallic substrate as an anode in an electrolytic cell in which the negative pole is connected to an auxiliary inactive electrode,

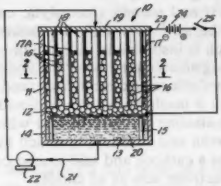
and applying a positive potential of at least 250 mV to the metallic substrate if measured with respect to a saturated Calomel electrode, for a time sufficient to form a high valence oxide-hydroxide coating on the substrate by anodic oxidation and then rinsing the sensor device with water.

7. The method as claimed in claim **1** in which the transition metal is selected from the group consisting of copper, cobalt, nickel and silver.

4,183,792
METHOD AND CELL FOR ELECTROLYTIC OXIDATION OF $NI(OH)_2$ WITH STATIONARY BED ELECTRODE

Willam G. Sherwood, and Paul B. Queneau, both of Golden, Colo., assignors to Amax Inc., Greenwich, Conn.

Filed Feb. 16, 1979, Ser. No. 12,775
Int. Cl.² C25B *1/00, 11/04*
U.S. Cl. 204—96 **36 Claims**



1. A method of oxidizing nickelous hydroxide to substantially the nickelic state which comprises,

forming an aqueous slurry of said nickelous hydroxide containing free sodium hydroxide,

feeding said slurry to an electrolytic oxidation cell comprising an anode in the form of a supported fixed bed of nickel pellets and a plurality of parallel-connected cathodes extending into and in contact with the bed of said pellets,

said cathodes being covered with a perforated layer of electrically insulating material to inhibit electrical shorting of said cathodes with said bed of nickel pellets,

electrically activating said cell,

and circulating said hydroxide slurry through said anode bed for a time sufficient to effect oxidation of said nickelous hydroxide to substantially the nickelic state.

4,183,793
ELECTROLYSIS OF ALKALI-METAL HALIDES

Edward N. Balko, Trenton; Shyam D. Argade, Woodhaven, and James E. Shrewsburg, Southgate, all of Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

Division of Ser. No. 742,818, Nov. 18, 1976, Pat. No. 4,036,729. This application Aug. 18, 1978, Ser. No. 935,038
Int. Cl.² C25B *1/16, 1/26, 13/02, 13/08*
U.S. Cl. 204—98 **9 Claims**

1. In a method of operating a chlor-alkali electrolysis cell having a foraminous cathode member, the practice of

providing upon said member a diaphragm having dimensions and a chemical composition such that said diaphragm is one consisting essentially of fibers having a cross-sectional dimension of 0.3 to 5 microns, said fibers being composed of a fluorine-containing addition polymer selected from the group consisting of the homopolymers of chlorotrifluoroethylene and copolymers of chlorotrifluoroethylene with at least one compatible unsaturated C_2–C_4 monomer, units of chlorotrifluoroethylene accounting for at least 80 percent of the monomeric units of said copolymer, which exhibits the property of developing, while in service in the hostile environment of a chlor-alkali cell, a surface portion of composition different from that of the bulk of said fiber and effective after period of use of approximately two weeks to increase substantially the burst strength and to prolong substantially the service life of the diaphragm in said cell,

installing said diaphragm in said cell, and

continuing the operation of said cell to produce chlorine and caustic for a period of time sufficient to cause the development upon said fibers of said surface portion of substantially different composition.

4,183,794

ZINC EXTRACTION METHOD

Richard H. C. L. Ross, 1701 Avoca Apartments, 10 Avoca Ave., Toronto, Ontario, Canada (M4T 2B7)

Continuation-in-part of Ser. No. 777,270, Mar. 14, 1977, abandoned. This application Dec. 22, 1977, Ser. No. 863,190

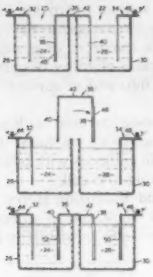
Int. Cl.[2] C25C *1/16, 7/08*

U.S. Cl. 204—119 **6 Claims**

1. A method of extracting primary zinc metal from an acid zinc sulfate solution derived from an ore concentrate, the method comprising the steps of:

providing: first and second electrolytic cells, the first cell receiving the acid zinc sulfate solution and having an anode which is insoluble in said solution, and the second cell receiving an alkaline electrolyte and having a cathode which is insoluble in said electrolyte; and a common electrode which is insoluble both in said acid sulfate solution and in said alkaline electrolyte, and which can be transferred between said first cell, in which the common electrode acts as a cathode and said second cell, in which the common electrode acts as an anode;

subjecting said zinc sulfate solution to electrolysis in said first cell with said electrode acting as a cathode, thereby



causing primary zinc metal to be deposited as a coating on said common electrode;

transferring the coated electrode from said first cell to said second cell;

subjecting said alkaline electrolyte to electrolysis so that said primary zinc metal is transferred from the electrode to the cathode of said second cell in a sponge-like form; and,

mechanically removing the zinc sponge from the cathode of said second cell.

4,183,795

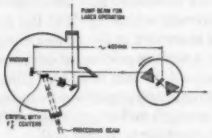
CREATION OF F_2^+ COLOR CENTERS

David M. Bloom, Holmdel, and Linn F. Mollenauer, Colts Neck, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed May 23, 1978, Ser. No. 908,774

Int. Cl.[2] B01J *1/10*

U.S. Cl. 204—157.1 R **8 Claims**



1. A process for creating F_2^+ color centers in alkali halide crystals having external electron traps which comprises the steps of:

cooling said alkali halide crystal;

damaging said alkali halide crystal to form anion vacancies and F color centers therein;

warming said alkali halide crystal so that F_2 color centers are formed therein, said F_2 color centers having an excited state lying between the ground state of said F_2 color center and the conduction band, which excited state has a first energy difference from said ground state of said F_2 color center, said F color centers having other excited states at other energy differences above the ground state of said F color center;

cooling said alkali halide crystal to laser operating temperature; and

irradiating said alkali halide crystal with radiation from an irradiating means, said radiation having photons with an energy substantially equal to said first energy difference and not substantially equal to said other energy differences, whereby a first photon from said radiation excites said F_2 color center from said ground state to said excited state and a second piston from said radiation ejects an electron from said F_2 color center in said excited state to form said F_2^+ color center, said electron being captured by said external electron traps.

4,183,796

RADIATION CURABLE OLIGOMERS BASED ON TRIS(2-HYDROXYETHYL) ISOCYANURATE

Robert E. Ansel, Hoffman Estates, and John C. Graham, Palatine, both of Ill., assignors to DeSoto, Inc., Des Plaines, Ill.

Filed Feb. 9, 1978, Ser. No. 876,497

Int. Cl.[2] C08F *2/50, 4/00*

U.S. Cl. 204—159.23 **14 Claims**

1. A radiation curable oligomer constituted by an hydroxy functional polyester having its active hydrogen atoms endcapped by reaction with ethylenically unsaturated monoisocyanate, said polyester being the reaction product of one mole of tris(2-hydroxyethyl)isocyanurate with three moles of saturated dicarboxylic acid and three moles of diol, these proportions being variable within the limits of ±20%, said polyester reaction product having an acid value of less than 20 and providing hydroxyl-terminated branches having an average length corresponding to a calculated molecular weight of 100–1500.

4,183,797

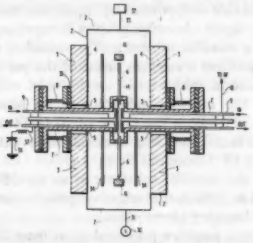
TWO-SIDED BIAS SPUTTER DEPOSITION METHOD AND APPARATUS

Thomas N. Kennedy, San Jose; William C. Lester, Los Gatos; George W. McDonough, Cupertino, and John D. Michaelsen, Los Gatos, all of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 22, 1978, Ser. No. 972,593

Int. Cl.[2] C23C *15/00*

U.S. Cl. 204—192 R **12 Claims**



1. A sputtering apparatus for coating both sides of a flat substrate comprising:

a vacuum chamber;
means for evacuating gases from said vacuum chamber;
means for inserting a gas capable of supporting a sputtering operation;
a plurality of planar cathode/targets, at least two being mounted parallel to each other and each including a centrally located cutout, said cathode/targets including a material of the coating to be sputtered on the substrate on at least the facing surface;
a pair of ram means for insertion through the cutout of both parallel cathode/targets for slidable movement therewith, one end of each of said rams lying between the parallel cathode/targets and forming a hub to contact and support the substrate therebetween;
means around the periphery of the substrate for suppressing plasma glow;
magnetic means for enhancing the sputtering about both parallel cathode/targets;
means connected to both of said rams for controlling the temperature of the substrate; and
means connected to at least one of said rams for applying an electrical potential for biasing the substrate;
said rams formed of an electrically conductive material and including means for transmitting said temperature controlling means to the substrate.

4,183,798

STABILIZED ZIRCONIUM DIOXIDE COMPOSITIONS AND OXYGEN SENSORS UTILIZING SAID COMPOSITIONS

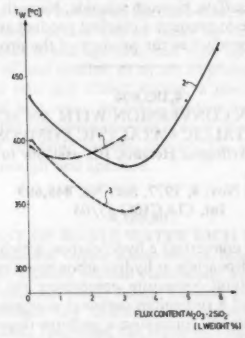
Friedrich J. Esper, and Karl-Hermann Friese, both of Leonberg, Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Mar. 20, 1978, Ser. No. 888,161

Claims priority, application Fed. Rep. of Germany, Apr. 1, 1977, 2714558

Int. Cl.[2] C04B *35/48*; G01N *27/58*

U.S. Cl. 204—195 S **4 Claims**



1. A stabilized zirconium dioxide composition with a substantially lowered temperature at which the specific resistivity of the composition, in sintered condition, goes below 1MΩ cm, which composition contains: (i) calcium oxide and (ii) magnesium oxide as stabilizers, said stabilizers being present in a total amount of between 16 and 18 mole percent, with a mole ratio of calcium oxide to magnesium oxide of between 4:1 and 2:1 except to any extent that between 0.5 and 5 mole percent of said stabilizing calcium oxide is replaced by at least one oxide selected from the group consisting of yttrium oxide and ytterbium oxide, and also containing between 2 and 4% percent by weight of kaolin used as a flux, the remainder of the composition consisting essentially of zirconium dioxide.

4. An oxygen sensor particularly useful for determining the oxygen content of exhaust gases from internal combustion engines containing at least one oxygen concentration measuring cell, each said measuring cell comprising at least one catalytically active electrode adapted to be contacted with the said exhaust gases, and a second electrode separated from said catalytically active electrode and in ion communication therewith by a solid stabilized zirconium dioxide electrolyte composed of the sintered zirconium dioxide composition of claim 1.

4,183,799

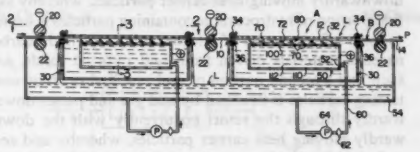
APPARATUS FOR PLATING A LAYER ONTO A METAL STRIP

Thomas A. Sellitto, Chardon, and Allen W. White, Harpersfield, both of Ohio, assignors to Production Machinery Corporation, Mentor, Ohio

Filed Aug. 31, 1978, Ser. No. 938,656

Int. Cl.[2] C25D *17/00, 17/12*

U.S. Cl. 204—206 **22 Claims**



1. In a device for plating a thin layer of a first metal onto a downwardly facing surface of a generally flat metal strip having a downwardly facing surface, an upwardly facing surface, and a width, said metal strip being formed from a second metal as the strip is moving in a selected direction along a given path through a chamber filled with a stable electrolyte containing a supply of ions of said first metal, said strip having a longitudinal center portion and outer longitudinal edge portions generally defining the width of said strip, said device including means for making said strip a cathode and an anode in said chamber and coextensive with and generally parallel to said lower surface to define a space between said anode and said lower surface and means for applying a voltage differential between said strip and said anode to electrically deposit said ions onto said lower surface of said moving strip, the improvement comprising: said anode including an upper electrically conductive, non-consumable, element transversely aligned with said center portion of said strip and extending along one side of said space, said conductive element facing said moving strip and extending along said path, said element having a transversely contoured outer surface with a transverse width substantially as great as said strip width, and facing said downwardly facing surface, said outer surface contour being generally convex and having a center portion and edge portions with said center portion being closer to said center portion of said strip than said edge portions are to said edge portions of said strip; means for maintaining electrolyte in said space; means forming a plenum chamber communicated with said element; closely spaced apertures in said element between said plenum chamber and said outer surface over substantially the complete area of said outer surface; means for forcing said electrolyte into said plenum chamber, through said apertures and through said space to impinge as jets against said downwardly facing surface of said moving strip; and, means for preventing plating of said second metal onto said upwardly facing surface.

4,183,800

INDIRECT HEAT RETORTING PROCESS WITH COCURRENT AND COUNTERCURRENT FLOW OF HYDROCARBON-CONTAINING SOLIDS

David S. Mitchell, and David R. Sageman, both of San Rafael, Calif., assignors to Chevron Research Company, San Francisco, Calif.

Filed Mar. 28, 1978, Ser. No. 891,084

The portion of the term of this patent subsequent to Jan. 9, 1996, has been disclaimed.

Int. Cl.[2] C10G *1/00*

U.S. Cl. 208—8 R **7 Claims**

1. In a process wherein raw hydrocarbon-containing parti-

cles are retorted in a vertically elongated retort by heating said hydrocarbon-containing particles to retorting temperatures by heat transfer from solid heat carrier particles passed through said retort from an upper portion thereof, the improvement which comprises:

(a) passing a non-oxidizing gas upwardly through said retort from a lower portion thereof at a rate sufficient to maintain said heat carrier particles in a fluidized state;

(b) introducing said raw hydrocarbon-containing particles into an intermediate portion of said retort;

(c) maintaining the size of said raw hydrocarbon-containing particles such that a first portion of said raw hydrocarbon-containing particles is entrained by said gas and passes upwardly through the retort countercurrently to the downwardly moving heat carrier particles, whereby said first portion of hydrocarbon-containing particles is heated to form a first portion of retorted solids and hydrocarbonaceous materials driven from said retorted solids, and such that a second portion of said raw hydrocarbon-containing particles is fluidized by said gas and passes downwardly through the retort cocurrently with the downwardly moving heat carrier particles, whereby said second portion of hydrocarbon-containing particles is heated to form a second portion of retorted solids and hydrocarbonaceous materials driven from said retorted solids;

(d) maintaining substantially plug flow of the solids and gases through the retort by limiting gross vertical backmixing of said solids and gases;

(e) withdrawing effluent solids from a lower portion of the retort, which effluent solids include the heat carrier particles and the second portion of retorted solids; and

(f) withdrawing the first portion of retorted solids, the non-oxidizing gas, and the hydrocarbonaceous materials driven from said first and second portions of the retorted solids from an upper portion of the retort.

4,183,801

PROCESS FOR PREPARING HYDROCARBONS

Jacobus H. Breuker; Hubertus N. H. De Haan, and Pieter B. Kwant, all of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Nov. 13, 1978, Ser. No. 960,503

Claims priority, application Netherlands, Nov. 29, 1977, 7713122

Int. Cl.[2] C10G *13/02, 37/02, 23/02*

U.S. Cl. 208—59 **11 Claims**

1. A process for preparing light hydrocarbon fractions and medicinal oil from a heavy hydrocarbon oil which comprises:

(a) hydrocracking said heavy hydrocarbon oil feed in a first stage at an elevated temperature and pressure and in the presence of hydrogen over a weakly or moderately acidic catalyst comprising one or more metals having hydrogenating activity on a carrier and passing the total reaction product to a second hydrocracking stage,

(b) hydrocracking said product from step (a) at an elevated temperature and pressure and in the presence of hydrogen over a moderately or strongly acidic catalyst comprising one or more metals having hydrogenating activity on a carrier, and

(c) separating the reaction product from step (b) by fractionation distillation into at least one light distillate hydrocarbon fraction and a residue, and

(d) converting at least part of said residue into medicinal oil by contacting said residue at an elevated temperature and pressure and in the presence of hydrogen with a catalyst comprising at least one noble metal of Group VIII on a carrier.

4,183,802

PROCESS FOR THE PRODUCTION OF COKE FROM PITCH

Ingo Romey, Hünxe, Fed. Rep. of Germany, assignor to Bergwerksverband GmbH, Essen, Fed. Rep. of Germany

Continuation of Ser. No. 783,339, Mar. 31, 1977, abandoned. This application Oct. 20, 1978, Ser. No. 953,168

Claims priority, application Fed. Rep. of Germany, Apr. 3, 1976, 2614490

Int. Cl.[2] C10G *17/00*

U.S. Cl. 208—88 **9 Claims**

1. A process for producing needle-shaped coal pitch coke, comprising the steps of heating a coal-tar pitch having a softening point within the range of 60°–80° C. and at least one other coal-tar pitch having a softening point within the range of 100°–180° C.; heating the pitches to an elevated temperature; filtering the pitches to remove solid impurities therefrom; mixing the pitches so as to form a pitch mixture having a softening point within the range of 70°–120° C. and containing both said one pitch and said other pitch in amounts which are respectively at least ten percent by weight of the total mixture; and coking the filtered mixture to produce the desired needle-shaped coal pitch coke.

4,183,803

PASSIVATING METALS ON CRACKING CATALYSTS

Dwight L. McKay, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 819,027, Jul. 26, 1977, Pat. No. 4,141,858, which is a continuation-in-part of Ser. No. 671,231, Mar. 29, 1976, abandoned. This application Dec. 15, 1978, Ser. No. 970,081

Int. Cl.[2] C10G *11/02*; B01J *8/24*

U.S. Cl. 208—120 **16 Claims**

1. A cracking process which comprises contacting under cracking conditions a hydrocarbon feedstock, a cracking catalyst and a modifying amount of at least one compound selected from the group consisting of antimony selenide, antimony sulfide, antimony sulfate, bismuth selenide, bismuth sulfide and bismuth phosphate to produce a cracked product and recovering said cracked product as the product of the process.

4,183,804

HYDROCARBON CONVERSION WITH AN ACTIVATED MULTIMETALLIC CATALYTIC COMPOSITE

George J. Antos, Arlington Heights, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Nov. 4, 1977, Ser. No. 848,699

Int. Cl.[2] C10G *35/08*

U.S. Cl. 208—139 **18 Claims**

1. A process for converting a hydrocarbon which comprises contacting the hydrocarbon at hydrocarbon conversion conditions with a catalytic composite comprising the pyrolyzed reaction product of a ruthenium carbonyl component with a porous carrier material containing a uniform dispersion of a catalytically effective amount of a platinum group component maintained in the elemental metallic state.

4,183,805

HYDROCARBON CONVERSION WITH AN ATTENUATED SUPERACTIVE MULTIMETALLIC CATALYTIC COMPOSITE

George J. Antos, Bartlett, Ill., assignor to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 833,332, Sep. 14, 1977. This application Sep. 18, 1978, Ser. No. 943,492

Int. Cl.[2] C10G *35/08*

U.S. Cl. 208—139 **21 Claims**

1. A process for the conversion of a hydrocarbon which comprises contacting said hydrocarbon with a catalytic composite comprising a combination of a catalytically effective amount of a pyrolyzed rhenium carbonyl component with a

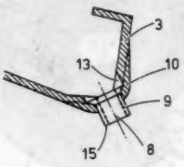
porous carrier material containing a uniform dispersion of catalytically effective amounts of a platinum group component, which is maintained in the elemental metallic state, and of a manganese component at hydrocarbon conversion conditions.

4,183,806

GRAVITATIONAL SEPARATOR EMPLOYING AN IMPROVED ELUENT SUPPLY SYSTEM

Philip J. Giffard, Southport, Australia, assignor to Mineral Deposits Limited, Australia

Filed Nov. 17, 1977, Ser. No. 852,456
Claims priority, application Australia, Nov. 22, 1976, PC8217
Int. Cl.[2] B03B *3/36*
U.S. Cl. 209—459 **8 Claims**



1. In a gravitational separator having a helical separator sluice down which a stream of eluent and particulate material to be separated flows, and a co-axial eluent supply means having a helical gallery conduit with the same pitch as the separator sluice, means to feed eluent to the upper end of said conduit at a rate ensuring discharge of residual eluent from the lower end of the conduit, said conduit having a free floor surface throughout its length over which the eluent stream flows, and a plurality of tap-off means to feed eluent from said conduit to said separator sluice; the improvement wherein each tap-off means comprises an insert extending through said conduit, said insert having an aperture therein communicating with said eluent stream and an inner lip defining an eluent stream entrance to said aperture, said inner lip being positioned in the floor of said conduit so as not to protrude substantially therebeyond into said eluent stream, a portion of the inner periphery of said inner lip being broken away to a greater extent than the remaining inner periphery of said inner lip, said insert being rotatable thereby to vary the amount of eluent delivered through said aperture.

4,183,807

TREATMENT OF WASTE WATER RICH IN NUTRIENTS

Kiyoshi Yoshizawa, Tokyo; Kikuo Nojiro, Machida; Katsuyoshi Mitsutomi, Ushiku; Hiroshi Hashimoto, Yachiyo; Akira Noguchi, Urawa, and Kazuo Tanno, Tanashi, all of Japan, assignors to National Tax Administration Agency, Chiyoka; Toho Zinc Co. Ltd., Tokyo and The Hokuren Federation of Agricultural Cooperative Associations, Sapporo, all of, Japan

Filed Sep. 11, 1978, Ser. No. 941,017
Claims priority, application Japan, Sep. 12, 1977, 52-108758; Aug. 1, 1978, 53-93117
Int. Cl.[2] C02C *1/04, 5/10*
U.S. Cl. 210—2 **3 Claims**

1. A method of treating waste water rich in nutrients, comprising:

adding to a waste water rich in nutrients a polysaccharide assimilating yeast selected from the group consisting of *Debaryomyces hansenii D-N*, FERM-P No. 3592, *Pichia acaciae AM-37W*, FERM-P No. 3593, *Hansenula anomala Y*-1, FERM-P No. 3594, *Pichia nakazawae LKB*-335, FERM-P No. 3595, *Pichia dispora Pd*-671, FERM-P No. 3596, *Candida sp. As*-50, FERM-P No. 3597, *Endomycopsis platypodis AM*-46, FERM-P No. 3598, *Saccharomyces cerevisiae BR*-1, FERM-P No. 3972, and *Saccharomyces cerevisiae var. ellipsoideus YS*-1, FERM-P No. 4498

thereby making said yeast assimilate the nutrients in the waste water; and

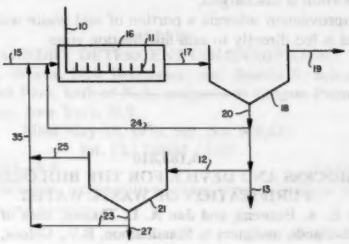
flowing the obtained waste water into an activated sludge tank in which the obtained waste water is treated with an activated sludge.

4,183,808

PHOSPHATE REMOVAL FROM WASTEWATER

Raymond F. Drnevich, Clarence, N.Y., assignor to Union Carbide Corporation, New York, N.Y.

Filed Nov. 23, 1977, Ser. No. 854,320
Int. Cl.[2] C02C *1/06*
U.S. Cl. 210—5 **14 Claims**



1. In an activated sludge wastewater treatment process for removing phosphate from BOD-containing wastewater in which phosphate-containing influent wastewater is mixed with activated sludge and oxygen-containing gas in an aeration zone to reduce the BOD content of the wastewater and cause the activated sludge bacteria to take up phosphate to form oxygenated phosphate-enriched mixed liquor which is discharged from said aeration zone and passed to a separate zone for concentration of solids to provide a phosphate-depleted effluent and phosphate-enriched sludge at least part of said phosphate-enriched sludge is passed to an anoxic zone to resolubilize phosphate from the phosphate-enriched sludge and form solubilized phosphate-containing sludge, the improvement comprising: returning at least a major fraction of said solubilized phosphate-containing sludge directly to said aeration zone as at least part of said activated sludge and without intervening addition of a phosphate precipitant for phosphate removal therefrom to biologically remove phosphate from said BOD-containing influent wastewater, maintaining the average food/biomass ratio of said liquor in said aeration zone during said mixing at a level such that the product of the food/biomass ratio (in pounds BOD_5/day × pound volatile suspended solids) and the influent wastewater food/influent phosphorus ratio (in pounds BOD_5 per 1 pound phosphorus) is at least 10, and removing phosphate from the process solely by wasting from at least one of said sludges.

4,183,809

PROCESS FOR REMOVING ORGANIC SUBSTANCES AND NITROGEN COMPOUNDS FROM WASTE WATER

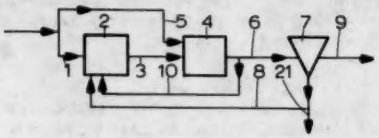
Abraham Klapwijk, Wageningen, and Gatze Lettinga, Ede, both of Netherlands, assignors to Stamicarbon, B.V., Geleen, Netherlands

Filed Feb. 27, 1978, Ser. No. 881,531
Claims priority, application Netherlands, Mar. 2, 1977, 7702236
Int. Cl.[2] C02C *1/04*
U.S. Cl. 210—8 **12 Claims**

1. In a process for the removal of organic substances and nitrogen compounds from waste water by means of microorganisms wherein:

waste water to be treated is passed continuously through a denitrification zone;

effluent from said denitrification zone is passed through a nitrification zone; and



at least a portion of the effluent from the nitrification zone is recycled to the denitrification zone and the remaining portion is discharged,

the improvement wherein a portion of said waste water to be treated is fed directly to said nitrification zone.

4,183,810

PROCESS AND DEVICE FOR THE BIOLOGICAL PURIFICATION OF WASTE WATER

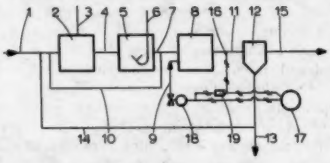
Victor E. A. Baenens, and Jan A. L. Thissen, both of Geleen, Netherlands, assignors to Stamicarbon, B.V., Geleen, Netherlands

Filed May 11, 1978, Ser. No. 905,172

Claims priority, application Netherlands, May 17, 1977, 7705427

Int. Cl.² C02C *5/10*

U.S. Cl. 210—11 **6 Claims**



1. Process for the biological purification of waste water containing nitrogen compounds wherein said biological purification process comprises at least one step and in which the waste water is denitrified in the final step of said biological purification while additional BOD is added to this final denitrification step, and wherein the BOD supply to said final denitrification step is controlled automatically by means of continuous analysis of the nitrite-plus-nitrate content in said final denitrification step or in the discharge from this step, said continuous analysis comprising the steps of,

(i) withdrawing and filtering of a continuous sample flow of the waste water;

(ii) preferential converting of all nitrite into nitrate or all of the nitrate into nitrite;

(iii) preferential spectrophotometric determining of the nitrite or nitrate content;

(iv) transforming of the resulting signal into a signal to the BOD supply by means of a proportionally integrating controller; and

(v) zero adjusting of the analysis equipment on a regular basis during at least part of the time required for said adjusting, said analysis equipment is bridged while the BOD supply is kept at a rate constant with the last predetermined value.

4,183,811

MEMBRANE UNIT AND DEVICE FOR CLEANSING BLOOD

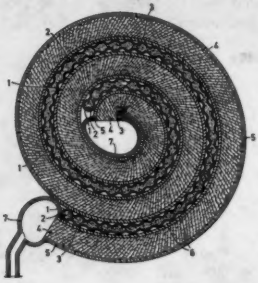
Axel Walch, Frankfurt, and Ludwig Lammers, Idstein, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Sep. 1, 1977, Ser. No. 829,941

Claims priority, application Fed. Rep. of Germany, Sep. 2, 1976, 2639549; May 4, 1977, 2719814

Int. Cl.² B01D *13/00*

U.S. Cl. 210—23 R **33 Claims**



1. A membrane unit for simultaneously removing toxic metabolites and metabolites normally present in urine from blood, comprising at least one cavity through which the contaminated blood passes, said cavity being defined by a first wall comprised of a permselective membrane having a pore size adapted to selectively remove from the blood metabolites normally present in urine, including water, electrolytes, urea and ammonia, and a second wall spaced from said first wall and comprising at least one adsorbant for removing toxic metabolites from the blood, whereby the blood simultaneously directly contacts both said first and second walls in said cavity.

29. A method for simultaneously removing toxic metabolites and metabolites normally present in urine from blood, comprising the step of simultaneously directly contacting the blood with at least one permselective membrane having a pore size adapted to selectively remove from the blood metabolites normally present in urine, including water, electrolytes, urea and ammonia, and at least one adsorbent for removing toxic metabolites from the blood.

4,183,812

FLUID FILTERING DEVICE

Borje O. Rosaen, 4031 Thornoaks Dr., and Dale P. Fosdick, 3000 Hunting Valley, both of Ann Arbor, Mich. 48104

Filed Jan. 22, 1979, Ser. No. 5,342

Int. Cl.² B01D *35/14*

U.S. Cl. 210—131 **11 Claims**

1. A fluid filtering device adapted for connection with a fluid line, said device comprising:

a housing having an inlet and an outlet;

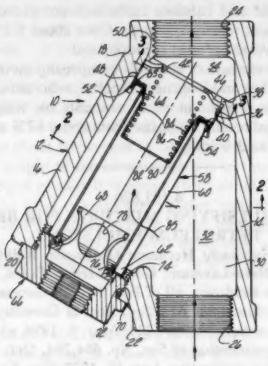
fluid passage means formed through said housing for fluidly connecting said inlet with said outlet, said fluid passage means having an elongated cylindrical wall portion formed between said inlet and said outlet;

a filter assembly comprising a tubular filter element open at each axial end and a cap axially slidably mounted to a first axial end of the filter element, said cap including means for fluidly closing said first end of said filter element when said first end axially abuts against said cap and means for fluidly opening said first end of the filter element when said filter element is spaced outwardly from said cap;

means for attaching said filter assembly to said housing so that the other end of the filter element is received within and sealingly engages the cylindrical wall portion, the

outer periphery of said tubular filter element being open to said inlet and the interior of the filter element being open to said outlet;

said filter element being longitudinally slidable between a first position in which the first end of the filter element



sealingly abuts against the cap and a second position in which said filter element is spaced outwardly from said cap; and

means for resiliently urging said filter element towards its first position.

4,183,813

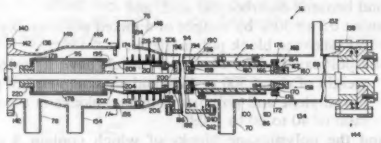
MIXTURE CONCENTRATOR

Donald S. Black, and J. Bruce Palmer, both of Edmonton, Canada, assignors to Palmer Engineering Company Ltd., Alberta, Canada

Filed Nov. 15, 1978, Ser. No. 960,840

Int. Cl.[2] B01D *45/14*

U.S. Cl. 210—512 R **21 Claims**



1. A concentrator for removing a medium from a mixture of media comprising:

an elongate vessel having a mixture intake and a concentrated mixture outlet spaced downstream from said mixture intake and having a removed medium outlet; and

an elongate rotor rotatably mounted for rotation in a forward direction inside said vessel so as to define an annular channel between said vessel and said rotor, said rotor having an internal passageway and comprised of intake impeller means for drawing off the medium from said annular channel into said internal passageway, rotor seal means axially located between said concentrated mixture outlet and said removed medium outlet for limiting flow of said concentrated mixture into said removed medium outlet, and means for connecting said internal passageway in communication with said removed medium outlet.

4,183,814

ASBESTOS COMPOSITION HAVING ORGANO-SILANE COATING

Sundaresan Ramachandran, North Tonawanda, N.Y., assignor to Union Carbide Corporation, New York, N.Y.

Filed Jan. 3, 1978, Ser. No. 866,525

Int. Cl.[2] C07F *7/10*; C09K *7/00*

U.S. Cl. 252—8.5 C **6 Claims**

1. An asbestos base material comprising opened chrysotile asbestos having a precipitation deposited siliceous layer and an organo-silane coating bonded to and over-lying said siliceous layer.

2. A drilling fluid for use in oil and gas drilling operations containing from about 0.10 to 7% by weight of the material of claim 1.

4,183,815

LAUNDRY DETERGENT COMPOSITIONS

Harold E. Wixon, New Brunswick, and Ronald S. Schreiber, Highland Park, both of N.J., assignors to Colgate-Palmolive Company, New York, N.Y.

Filed May 15, 1978, Ser. No. 905,622

Int. Cl.[2] D06M *13/50*

U.S. Cl. 252—8.8 **26 Claims**

1. A detergent composition comprising a surface active detergent and kyanite.

4,183,816

USE OF 2,4-DI(LOWER ALKYL)-1,2,4-THIADIAZOLIDIN-3,5-DIONES AS ADDITIVES FOR FUNCTIONAL FLUIDS

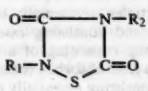
David F. Gavin, Cheshire; Frank J. Milnes, Guilford, and John R. Parziale, Wallingford, all of Conn., assignors to Olin Corporation, New Haven, Conn.

Filed Nov. 1, 1978, Ser. No. 956,555

Int. Cl.[2] C10M *1/20, 1/32, 1/38*

U.S. Cl. 252—47.5 **7 Claims**

1. A functional fluid composition comprising a major amount of a base fluid selected from the group consisting of lubricants and hydraulic oils and minor amount of an additive selected from the group consisting of 2,4-di(lower alkyl)-1,2,4-thiadiazolidin-3,5-diones of the formula:



wherein R_1 and R_2 are lower alkyl groups having 1–4 carbon atoms.

4,183,817

LOAD-CARRYING ADDITIVES AND COMPOSITIONS THEREOF

Abraham O. Okorodudu, West Deptford, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Jan. 3, 1978, Ser. No. 866,579

Int. Cl.[2] C10M *1/10*

U.S. Cl. 252—49.9 **14 Claims**

1. A composition comprising a major proportion of an oil of lubricating viscosity or grease prepared therefrom and a minor proportion sufficient to impart load-carrying characteristics thereto of a compound having the following general structure:

$$(RR'N)_n-P-\left[\begin{array}{l}CO_2R^5\\ C-CR^3R^4NRR'\\ R^2\end{array}\right]_q^{-5}$$

where n is 0, 1 or 2; q is 1, 2 or 3, with the proviso that the sum of n and q equal 3 and where R and R′ are each selected from alkyl of from 1 to about 32 carbon atoms, aryl, aralkyl or alkaryl of 6 to about 30 carbon atoms, alicyclic (C_mH_{2m-1}) and RR′ is $(CH_2)_m$ comprising part of a heterocyclic system selected from pyrolidine, pryidine or piperidine and where m is from 1 to 6; R^2, R^3 and R^4 may be H, or alkyl of 1 to 32 carbon atoms or aryl, aralkyl, alkaryl of 6 to 30 carbon atoms, and R^5 may be alkyl, or nitrogen-substituted alkyl of 1 to 30 carbon atoms, aryl, aralkyl or alkaryl of 6 to 30 carbon atoms.

4,183,818

COLOR ELECTROPHOTOGRAPHIC LIQUID DEVELOPER OF COLORED PARTICLES AND ZINC OXIDE

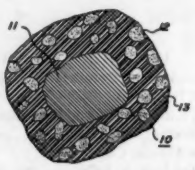
Masamichi Sato, and Hajime Miyazuka, both of Asaka, Japan, assignors to Xerox Corporation, Stamford, Conn.

Continuation of Ser. No. 887,980, Dec. 24, 1969, abandoned. This application Nov. 13, 1974, Ser. No. 523,613

Claims priority, application Japan, Dec. 28, 1968, 43-44980

Int. Cl.[2] G03G 9/00, 5/12

U.S. Cl. 430—115 **1 Claim**



1. A liquid developer for color electrophotography with multiple development processes which comprises a carrier liquid having a dielectric constant of less than about 3.4 and a volume resistivity of greater than about 10^{10} ohm-cm so as not to affect an electrostatic latent image formed on an insulating layer, and dispersed in said carrier liquid, a mixture of discrete colored toner particles and discrete photoconductive particles, said colored toner particles substantially lacking the property of photoconductivity and consisting essentially of colorant selected from the group consisting of a pigment and a dye having a thin layer of a resin absorbed therearound, said photoconductive particles consisting essentially of zinc oxide having a thin layer of a resin absorbed therearound, said thin layer of said resin absorbed therearound said zinc oxide being sufficiently thin to facilitate exposure of said zinc oxide and dissipate any charge thereon, said photoconductive particles being present in an amount of from about 5 to about 104 parts by weight for every 100 parts by weight of said colored toner particles.

4,183,819

SOLUTION AND METHOD FOR CLEANING, POLISHING AND LUBRICATING MAGNETIC HEADS

Solomon Stolove, 100 E. 18th St., Brooklyn, N.Y. 11236

Filed Jul. 12, 1978, Ser. No. 923,974

Int. Cl.[2] C11D 7/50; C09G 1/02; G11B 5/40

U.S. Cl. 252—144 **14 Claims**

14. A solution for cleaning, polishing and lubricating the magnetic record/playback head of a tape recorder comprising:

(a) a mixture of micropulverized inorganic oxides comprising aluminum oxide, chromium oxide, tin oxide, yellow lead oxide, cuprous oxide, iron oxide, and yellow iron oxide;

(b) a mixture of lower alkyl silanes comprising dimethyl silane, methyltrichlorsilane, and ethyldisilane;

(c) stearic acid;

(d) calcium carbonate; wherein each of said oxides, silanes, stearic acid and calcium carbonate are present in equal amounts and totally comprise from about 0.2% to about 33% by weight of said solution; and

(e) a solvent mixture of alcohols comprising methyl alcohol, ethyl alcohol and isopropyl alcohol; wherein each of said alcohols is present in equal amounts by weight in said solution and totally comprise from about 67% to 99.8% by weight of said solution.

4,183,820

USE OF DEMULSIFYING MIXTURES FOR BREAKING PETROLEUM EMULSIONS

Heinz Theile, Sulzbach; Hermann Hoffmann, Kelkheim; Gerd Rossmy, Haltern-Lavesum; Götz Koerner, Essen, and Peter Zäske, Essen-Bredeney, all of Fed. Rep. of Germany, assignors to Th. Goldschmidt AG, Fed. Rep. of Germany

Continuation of Ser. No. 664,211, Mar. 5, 1976, abandoned, which is a continuation of Ser. No. 404,794, Oct. 9, 1973, abandoned. This application Aug. 10, 1978, Ser. No. 932,816

Claims priority, application Fed. Rep. of Germany, Oct. 18, 1972, 2250920

Int. Cl.[2] B01D 17/04

U.S. Cl. 252—342 **15 Claims**

1. An emulsion-breaking composition comprising about 70 to 99.8% by weight of at least one silicon-free demulsifier selected from the group consisting of

I. reaction product of oxyalkylated phenol-formaldehyde resin with a dicarboxylic acid selected from the group consisting of saturated aliphatic dicarboxylic acids having 10 or less carbon atoms and benzene dicarboxylic acid, and

II. reaction product of a block and mixed polymerizate of propylene oxide and ethylene oxide with a dicarboxylic acid selected from the group consisting of saturated aliphatic dicarboxylic acids having 10 or less carbon atoms and benzene dicarboxylic acid, and

III. reaction product of a mixture of oxyalkylated phenol-formaldehyde resin and block and mixed polymerizates of propylene oxide and ethylene oxide with a dicarboxylic acid selected from the group consisting of saturated aliphatic dicarboxylic acids having 10 or less carbon atoms and benzene dicarboxylic acid, and

about 0.2 to 30% by weight of a mixed polyoxyalkylene-polysiloxane block polymerizate,

the polyoxyalkylene blocks of which have a molecular weight of about 500 to 4000 and are composed of polyoxyethylene and polyoxypropylene blocks in a weight ratio of 40 to 60 to 100:0,

and the polysiloxane blocks of which contain 3 to 50 silicon atoms per block.

4,183,821

HETERIC/BLOCK POLYOXYALKYLENE COMPOUNDS AS CRUDE OIL DEMULSIFIERS

William K. Langdon, Grosse Ile, and Ronald L. Camp, Riverview, both of Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

Filed May 26, 1978, Ser. No. 909,744

Int. Cl.[2] C10M 1/20; B01D 17/04; C07C 43/00, 43/04

U.S. Cl. 252—331 **17 Claims**

1. A polyoxyalkylene compound having the formula:

$$Y[(A)-(B)-H]_x$$

wherein Y is the residue formed by the removal of x atoms of active hydrogen from an initiator having a total of not more

than 20 carbon atoms and free of elements other than carbon, hydrogen and oxygen; A is a hydrophobic, heteric mixture of an oxytetramethylene radical, derived from tetrahydrofuran and at least one of a vicinal alkylene oxide derived from ethylene oxide, propylene oxide, and butylene oxide, said A being derived from the reaction of said oxides in the molar ratio of tetrahydrofuran: vicinal alkylene oxide of 3:1 to 1:1, B is C_2 or a mixture of C_2 and C_3–C_4 oxyalkylene radicals derived from ethylene oxide, 1,2-propylene oxide, and vicinal butylene oxide, provided said C_3–C_4 oxyalkylene radicals are present in a proportion of not more than 50 percent by weight of the total weight of said C_2 oxyalkylene radical; x is an integer of one to about five; m is an integer such that the total weight of said A is about 90 to about 10 percent by weight of the total oxyalkylene residue weight of the compound; n is an integer such that the total weight of said B is about 10 to about 90 percent by weight of the total oxyalkylene residue weight of the compound; the total molecular weight of the hydrophobe is about 900 to about 10,000; and the total molecular weight of said polyoxyalkylene compound is about 1000 to about 20,000.

4,183,822
BLOWING AGENT COMPOSITION

Kenneth T. Collington, St. Heots; Rishi R. Puri, and Peter J. Gibson, both of Hauxton, all of England, assignors to Fisons Limited, London, England

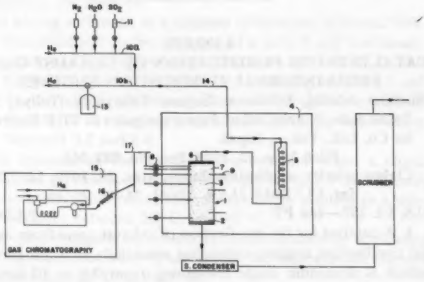
Continuation of Ser. No. 744,040, Nov. 22, 1976, abandoned, which is a division of Ser. No. 564,891, Apr. 3, 1975, abandoned.
This application Jan. 18, 1978, Ser. No. 870,930
Claims priority, application United Kingdom, Apr. 3, 1974, 14763/74
Int. Cl.[2] C09K *3/30*; C08J *9/08*
U.S. Cl. 252—350 **5 Claims**

1. A storage stable blowing agent composition which comprises a mixture of 100 parts by weight of a compound selected from the group consisting of zinc carbonate and cadmium carbonate with 5–50 parts by weight of a nucleating agent, with the proviso that if there is an acid present in said composition said acid has a pK_A value greater than 3 for each of its neutralisation points.

4,183,823
REGENERATION PROCESS FOR POISONED CLAUS ALUMINA CATALYST

Zacheria M. George, Edmonton, Canada, assignor to The Research Council of Alberta, Edmonton, Canada

Filed Sep. 14, 1977, Ser. No. 833,242
Int. Cl.[2] B01J *21/20*; C01B *17/04*
U.S. Cl. 252—411 S **2 Claims**



1. A method for regenerating the activity of an alumina catalyst poisoned through use in a Claus plant reactor by condensed sulfur, carbon deposits and aluminum sulfate, said method comprising:

(a) leaching the aluminum sulfate from the poisoned catalyst by washing it with water until the soluble sulfate content is reduced to less than 2.0% by weight; and then

(b) heating the washed catalyst to a temperature above 300° C. but below its sintering temperature in a diluted oxygen atmosphere to cause an oxidative removal of carbon deposits.

4,183,824
CATALYSTS FOR THE POLYMERIZATION OF OLEFINS

Akinobu Shiga; Yoshiharu Fukui, both of Niihama; Kazuhiro Matsumura, Ashiya; Toshio Sasaki, and Masahisa Okawa, both of Niihama, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Mar. 10, 1978, Ser. No. 885,249
Claims priority, application Japan, Mar. 10, 1977, 52/26729; Apr. 21, 1977, 52-46647
Int. Cl.[2] C08F *4/64*
U.S. Cl. 252—429 B **34 Claims**

1. A method for producing a solid titanium trichloride catalyst, which comprises reacting a titanium trichloride composition represented by the general formula (I):

$$TiCl_3(R_nAlZ_{3-n})_a(E)_b \quad \text{(I)}$$

wherein R has up to 18 carbon atoms and represents an aliphatic hydrocarbon group, which may be straight chain, branched chain or cyclic, or an aromatic hydrocarbon group; Z represents a halogen atom or a hydrogen atom; n is a number defined by the relationship $0 \leqq n \leqq 3$; a is a number defined by the relationship $0 < a < 1$; E represents an ether compound represented by the general formula (II):

$$R^1—O—R^2 \quad \text{(II)}$$

wherein R^1 and R^2, which may be the same or different, each represents a straight chain or branched chain alkyl group having 1 to 8 carbon atoms; and b is a number defined by the relationship $0 \leqq b < 1$; in the presence of a hydrocarbon solvent selected from the group consisting of hexane, heptane, octane, decane, benzene, toluene and zylene at a temperature of −30° to 200° C. for 5 minutes to 5 hours with a mixture of

(1) an ether represented by the general formula (III):

$$R^3—O—R^4 \quad \text{(III)}$$

wherein R^3 and R^4, which may be the same or different, each represents a straight chain or branched chain alkyl group having 1 to 8 carbon atoms, the amount of the ether compound being about 0.01 to 5.0 moles per mole of titanium trichloride in the titanium trichloride composition; and

(2) (a) a hydrocarbon compound containing a tertiary carbon atom and represented by the general formula (IV):

(IV)

wherein R^5, R^6, and R^7, which may be the same or different, each has up to 18 carbon atoms and represents an aliphatic hydrocarbon group, which may be straight chain, branched chain or cyclic, or an aromatic hydrocarbon group, with at least one of R^5, R^6 and R^7 being an aromatic hydrocarbon group, the amount of the hydrocarbon compound being about 0.01 to about 10 moles per mole of titanium trichloride in the titanium trichloride composition; and/or

(2) (b) an organic sulfur compound represented by the general formulas (V) and (VII):

$$R^9—S—S—R^{10} \quad \text{(V)}$$

$$HS—(CH_2)_d—SH \quad \text{(VI)}$$

wherein each of R^9 and R^{10} has up to 18 carbon atoms and represents an aliphatic hydrocarbon group, which may be straight chain, branched chain or cyclic, or an aromatic hydrocarbon group, where R^9 and R^{10} may be the same or different; and d is an integer of 2 to 8, the amounts of the organic sulfur compounds represented by the formulas of (VI) and (VII) being about 0.05 to about 1.0 mole and about 0.001 to about 0.2 mole per mole of titanium trichloride in the titanium trichloride composition, respectively.

4,183,825

METHOD FOR THE ACTIVATION OF POLYMER-BOUND BIS(TRIPHENYLPHOSPHINE)RHODIUM CARBONYL HALIDE HYDROFORMYLATION CATALYSTS

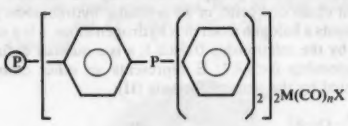
John T. Carlock, Ponco City, Okla., assignor to Conoco, Inc., Ponca City, Okla.

Filed Jul. 14, 1978, Ser. No. 924,597

Int. Cl.[2] B01J *31/24, 23/46, 27/10;* **C07C** *45/02*

U.S. Cl. 252—429 R **6 Claims**

1. A method for increasng the hydroformylation activity of a catalyst of the general structure



comprising treating the catalyst with a non-complexing base in a polar solvent capable of dissolving said base and swelling said polymer and refluxing the solution so obtained, and wherein M is rhodium or iridium, n is sufficient to satisfy metal valence, and X is bromine, chlorine, or iodine and Ⓟ is a polyvinyl pyridine/divinylbenzene copolymer.

4,183,826

TITANIUM TRICHLORIDE CATALYST AND PROCESS FOR THE PRODUCTION THEREOF

Hiroshi Ueno, Namekawa; Eiji Sezaki; Naomi Inaba, both of Ooi; Tokuo Makishima, Kawagoe; Koh Watanabe, Kunitachi, and Shozo Wada, Zushi, all of Japan, assignors to Toa Nenryo Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 774,947, Mar. 7, 1977, abandoned. This application Feb. 9, 1979, Ser. No. 10,763

Int. Cl.[2] C08F *4/64*

U.S. Cl. 252—429 B **34 Claims**

1. A process for the production of a titanium trichloride catalyst comprising:

reducing titanium tetrachloride with an organo metal compound of the formula R_nAlX_{3-n} wherein R is an alkyl or aryl group having 1 to 18 carbon atoms, X is a halogen atom, and n is a numeral within the range of $1 \leqq n \leqq 3$, at a temperature of from about −50° to about +30° C. to produce a reduced solids product;

contacting said reduced solids product with a chlorinated saturated aliphatic hydrocarbon having 3 to 8 carbon atoms and 2 to 6 chlorine atoms in the presence of a complexing agent selected from an aliphatic ether compound having 4 to 16 carbon atoms at an elevated temperature of about 60° C. to about 100° C. for about 1 to about 10 hours; and

recovering the resulting treated reduced solids product as a titanium trichloride catalyst.

4,183,827

SELECTIVELY SULFIDED ACIDIC MULTIMETALLIC CATALYTIC COMPOSITE

Frank H. Adams, La Grange Park, and H. Peter G. Knapik, Bloomingdale, both of Ill., assignors to UOP Inc., Des Plaines, Ill.

Division of Ser. No. 808,411, Jun. 20, 1977, Pat. No. 4,115,253, which is a continuation-in-part of Ser. No. 638,798, Dec. 8, 1975, Pat. No. 4,032,475. This application Jun. 8, 1978, Ser. No. 913,709

The portion of the term of this patent subsequent to Jun. 28, 1994, has been disclaimed.

Int. Cl.[2] B01J *27/04*

U.S. Cl. 252—439 **12 Claims**

1. A selectively sulfided acidic catalytic composite comprising a porous carrier material containing, on an elemental basis, about 0.01 to about 2 wt. % platinum group metal, about 0.1 to about 5 wt. % cobalt, about 0.01 to about 5 wt. % tin, about 0.01 to about 2 wt. % rhenium, and about 0.1 to about 3.5 wt. % halogen; wherein the platinum group metal, catalytically available cobalt, tin, and rhenium are uniformly dispersed throughout the porous carrier material; wherein substantially all of the platinum group metal is present in the elemental metallic state; wherein substantially all of the tin is present in the form of tin oxide; wherein substantially all of the catalytically available cobalt is present in a sulfided state and wherein substantially all of the rhenium is present in a sulfided state or in an elemental metallic state or in a mixture of these states.

4,183,828

CATALYST FOR DEHYDROCOUPLING PROCESS

Tao P. Li, Chesterfield, Mo., assignor to Monsanto Company, St. Louis, Mo.

Division of Ser. No. 735,865, Oct. 27, 1976, Pat. No. 4,091,044. This application Mar. 9, 1978, Ser. No. 884,795

Int. Cl.[2] B01J *23/14, 23/18*

U.S. Cl. 252—461 **2 Claims**

1. As an oxidant or catalyst for dehydrocoupling of toluene and toluene derivatives to produce stilbene and stilbene derivatives, the antimony, lead, bismuth and oxygen-containing composition having the formula

$$Sb_aPb_bBi_cO_d$$

wherein a is 1, b is 0.2 to 10, C is a positive number up to 5 and d is a number taken to satisfy the average valences of the Sb, Pb and Bi in the oxidation states in which they exist in said composition.

4,183,829

CATALYSTS FOR PURIFICATION OF EXHAUST GASES FROM INTERNAL COMBUSTION ENGINES

Shichiro Adachi, Ichikawa; Suguru Takayama, Tokyo, and Takuo Sato, Nikaho, all of Japan, assignors to TDK Electronics Co. Ltd., Tokyo, Japan

Filed Mar. 23, 1978, Ser. No. 889,342

Claims priority, application Japan, Mar. 25, 1977, 52/32892

Int. Cl.[2] B01J *21/04, 23/42, 23/44, 23/46*

U.S. Cl. 252—466 PT **9 Claims**

1. A catalyst for the purification of exhaust gases from internal combustion engines consisting essentially of (1) a carrier which is aluminum oxide containing from 0.1 to 10 weight percent of calcium oxide, from 50% to 90% of the aluminum oxide being in the corundum form, the carrier supporting (2) at least one element selected from the group consisting of from 0.001 to 2.0 weight percent of platinum, from 0.005 to 1.0 weight percent of palladium and from 0.005 to 1.0 weight percent of rhodium.

4,183,830

COMPOSITION OF A CONDUCTIVE CERAMIC GLAZE AND METHOD OF FORMING SAME

Victor J. Chester, Allentown, N.J., assignor to General Porcelain Mfg. Co., Trenton, N.J.

Filed May 30, 1978, Ser. No. 911,007
Int. Cl.[2] H01B 1/08
U.S. Cl. 252—519 14 Claims

1. An electrically conductive composition for glazing a ceramic mold form including a first combination comprising:
(a) feldspar: 24.0–28.0 percent by weight;
(b) flint: 20.0–24.0 percent by weight;
(c) calcium carbonate: 5.0–10.0 percent by weight;
(d) ball clay: 1.0–2.0 percent by weight;
(e) kaolin: 2.0–4.0 percent by weight;
(f) barium carbonate: 4.0–6.0 by weight
(g) red iron oxide: 30.0–36.0 by weight.

4,183,831

5-ETHYL-4-METHYL-METHYLNICOTINATE PERFUME COMPOSITIONS

Takaaki Toyoda, Ageo, and Shigeru Muraki, Ryugasaki, both of Japan, assignors to Takasago Perfumery Co., Ltd., Tokyo, Japan

Filed Jun. 8, 1978, Ser. No. 913,927
Claims priority, application Japan, Jun. 10, 1977, 52-67970
Int. Cl.[2] C11B 9/00
U.S. Cl. 252—522 R 1 Claim

1. A method of improving the naturalness of the fragrance of a perfume composition comprising adding of 5-ethyl-4-methyl-methylnicotinate to the perfume composition in an amount of about 0.1 to about 0.5% by weight based on the total weight of the perfume composition.

4,183,832

AQUEOUS SOLUTIONS OF ETHERIFIED MELAMINE-FORMALDEHYDE RESINS WITH LONG SHELF LIFE AND LOW FREE FORMALDEHYDE CONTENT

Jean-Paul Meunier, Clermont; Jacky Joachim, and Bernard Kafka, both of Rantigny, all of France, assignors to Saint-Gobain Industries, Neuilly-sur-Seine, France

Continuation of Ser. No. 681,844, Apr. 30, 1976, abandoned.
This application Apr. 20, 1978, Ser. No. 898,113
Claims priority, application France, Apr. 30, 1975, 75 13569
Int. Cl.[2] C08L 5/00
U.S. Cl. 260—17.3 35 Claims

1. A process for preparing a solution of melamine-formaldehyde resin etherified by condensation in alkaline solution of formaldehyde and melamine followed by an etherification, comprising the steps of:
(a) adding melamine to a solution of between 30% and 50% formaldehyde in the presence of a polyol and triethanolamine and at a temperature of between 60° and 70° C., the formaldehyde/melamine molar ratio being between 5 and 11, the polyol/melamine molar ratio being between 3 and 5 and the triethanolamine/melamine molar ratio being between 0.2 and 0.6;
(b) terminating the condensation reaction when a cloud point appears at between 40° C. and 65° C. for the reactant solution, this termination carried out by cooling to a temperature between 20° C. and 40° C.;
(c) etherifying the aqueous condensate solution by acidifying the solution while maintaining the temperature thereof between 20° C. and 40° C.;
(d) terminating the etherification by neutralizing the cooled acidic solution with a base that includes triethanolamine of a molar ratio of at least one-third molecule per molecule of melamine; and
(e) stabilizing the neutralized solution by maintaining it at a temperature of between 50° C. and 90° C.

4,183,833

NOVEL MODIFIED RESINS, PROCESS FOR PREPARING THE SAME, AND A COMPOSITION FOR PRINTING INK CONTAINING SAID MODIFIED RESINS AS VEHICLE COMPONENTS

Akinori Miyaguchi, and Yasuyoshi Chino, both of Yokohama, Japan, assignors to Nippon Zeon Co. Ltd. and Morimura-Chemetron Ltd., both of Tokyo, Japan

Filed Apr. 4, 1978, Ser. No. 893,353
Claims priority, application Japan, Apr. 8, 1977, 52/40120; Apr. 8, 1977, 52/40121
Int. Cl.[2] C09D 3/727, 3/733, 11/10
U.S. Cl. 260—23.7 C 21 Claims

1. A process for preparing modified resins comprising heating and reacting an addition product (A) of a cyclopentadiene resin and an α,β-unsaturated dicarboxylic acid anhydride with an addition product (B) of a higher aliphatic ester having a conjugated double bond and an α,β-unsaturated dicarboxylic acid anhydride, in an inert gas atmosphere.

4,183,834

IONIZED ROSIN-BASED RESINOUS MIXTURES AS TACKIFIERS FOR LATEX

James M. Evans, Lynn Haven, and Walter W. Spangler, Jr., Panama City, both of Fla., assignors to Sylvachem Corporation, Jacksonville, Fla.

Filed Dec. 11, 1978, Ser. No. 968,208
Int. Cl.[2] C08L 93/04, 9/10
U.S. Cl. 260—27 BB 22 Claims

1. A resinous polyelectrolyte dispersed in water comprising water and an ionizable resinous mixture which is ionized with a volatile ionizing agent, said ionizable resinous mixture being the reaction product of a rosin, a carboxylic acid, and a C_1–C_{18} mono-alcohol, said ionizable resinous mixture having a softening point not substantially above about 125° C. and an acid number of between about 30 and 150, said reaction product comprising the carbocylic nucleus of rosin having at least one carboxylic acid group and at least one carboxylic acid ester group of said monoalcohol.

19. An improved aqueous latex adhesive composition of a latex elastomer and tackifier dispersed in water, the improvement comprising said tackifier being a resinous polyelectrolyte of an ionizable resinous mixture which is ionized with a volatile ionizing agent, said ionizable resinous mixture being the reaction product of a rosin, a carboxylic acid, and a C_1–C_{18} mono-alcohol, said ionizable resinous mixture having a softening point not substantially above about 125° C. and an acid number of between about 30 and 150, said reaction product comprising the carbocylic nucleus of rosin having at least one carboxylic acid group and at least one carboxylic acid ester group of said mono-alcohol.

4,183,835

SALTS OF A BASIC NITROGENOUS COMPOUND AS STABILIZERS FOR NEUTRALIZED POLYAMIDE-ACID RESIN

Katsuhiko Yamaguchi; Yasuhiro Suzuki; Makoto Komima, and Hiroshi Shibata, all of Ibaraki, Japan, assignors to Nitto Electric Industrial Co., Ltd., Ibaraka, Japan

Filed Mar. 30, 1977, Ser. No. 782,809
Claims priority, application Japan, Sep. 29, 1976, 51/117484
Int. Cl.[2] C08K 3/26, 5/34, 5/19, 5/17
U.S. Cl. 260—29.2 TN 18 Claims

1. A method for stabilizing a water-soluble composition of a resin which comprises adding, as a stabilizing agent, a carbonate, a formate, an acetate or a propionate of a basic nitrogenous compound selected from the group consisting of ammonia, a primary amine, a secondary amine, a tertiary amine, a heterocyclic compound which acts as a tertiary amine, a quaternary ammonium compound or a mixture thereof, to the water-soluble composition in an amount of from about 0.01 to about 10 parts by weight based on 100 parts by weight of the content of

the resin in the water-soluble composition, said water-soluble resin composition being prepared by condensation reacting (i) an acid component consisting of 1,2,3,4-butane tetracarboxylic acid alone or a polycarboxylic acid component containing at least about 50 mol% of 1,2,3,4-butane tetracarboxylic acid and (ii) a diamine in the presence of a water-soluble solvent or, optionally in the presence of a water-soluble solvent and water, to obtain a condensation product having a residual acid value ratio of about 3 to about 50% of the acid value after condensation followed by formation of a salt of the condensation product with a basic nitrogeneous compound.

4,183,836

AQUEOUS POLYURETHANE DISPERSIONS

Harry W. Wolfe, Jr., Newark, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Feb. 6, 1978, Ser. No. 875,620
Int. Cl.[2] C08J *3/02*; C08L *75/04*
U.S. Cl. 260—29.2 TN **7 Claims**

1. A composition obtained by mixing an isocyanate-terminated, carboxyl group-containing prepolymer made by reaction of (A) 1 equivalent of an aliphatic diisocyanate with (B) total 0.6–0.8 equivalent of the following active hydrogen compounds:

(a) α,α-dimethylolacetic acid or a homologue thereof,

(b) a polymeric glycol selected from poly(alkyleneoxy) glycols and polyester glycols having a weight average molecular weight of about 400–3000, and

(c) N,N'-dicyanoethylpoly(propyleneoxy)diamine having a number average molecular weight of about 200–2000;

the amount of component (a) being about 0.08–0.25 hydroxyl equivalent per 100 g of total weight of all the reactants A and B, and the relative mole proportions of compounds (b) and (c) being about 30:70 to 70:30,

with an aqueous solution of a sufficient amount of a tertiary amine free of substituents reactive with isocyanate groups to convert substantially all the carboxyl groups of the prepolymer to carboxylate ions, then chain-extending the prepolymer with about stoichiometric amount, based on free isocyanate groups, of a diamine having at least one hydrogen attached to each nitrogen atom.

4,183,837

LIQUID COATING COMPOSITION CONTAINING VINYL FLUORIDE-HEXAFLUOROPROPYLENE RESIN

Yorikazu Tamura, and Yasuhisa Shishido, both of Hino, Japan, assignors to Teijin Limited, Osaka, Japan

Continuation of Ser. No. 457,412, Apr. 3, 1974, abandoned, which is a continuation-in-part of Ser. No. 267,920, Jun. 30, 1972, abandoned. This application May 12, 1975, Ser. No. 576,799
Int. Cl.[2] C08K *5/11*
U.S. Cl. 260—31.8 F **2 Claims**

1. A liquid coating composition which is stable at room temperature in the form of a solvent solution comprising a vinyl fluoride-hexafluoropropylene copolymer having an inherent viscosity of 0.2 to 2 and composed of 5 to 50 mol% of units derived from hexafluoropropylene, 0 to 10 mol% of units derived from a vinyl ester of an aliphatic carboxylic acid having 1 to 6 carbon atoms or 0 to 1 mol% of units derived from a nonomer selected from the group consisting of unsaturated aliphatic carboxylic acids having 3 to 6 carbon atoms, lower alkyl esters of acrylic acid having an epoxy group, and lower alkyl esters of methacrylic acid having an epoxy group, and the remainder being units derived from vinyl fluoride, a solvent for said vinyl fluoride-hexafluoropropylene copolymer said solvent selected from the group consisting of (1) aliphatic ketones having not over 9 carbon atoms, (2) alkyl esters having not over 10 carbon atoms of aliphatic monocarboxylic acids and halides thereof, (3) lower alkyl esters of aliphatic dicarboxylic acids having 2 to 7 carbon atoms, (4) aliphatic monocarboxylic acids having 2 to 4 carbon atoms and anhydrides thereof, (5) cyclic esters and (6) aliphatic nitriles having 2 to 6 carbon atoms, a cross-linking agent selected from the group consisting of aliphatic polyamines, aromatic polyamines and carbamate derivatives thereof, and a cross-linking promoter selected from oxides of alkaline earth metals, the amount of said copolymer being 1 to 50% by weight as solids content, based on the weight of the composition.

4,183,838

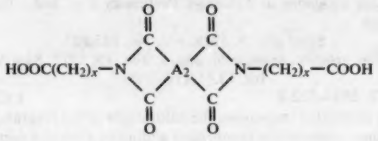
POLYIMIDE RESIN-FORMING COMPOSITION

John Gagliani, San Diego, Calif., assignor to John V. Long, El Cajon, Calif., a part interest

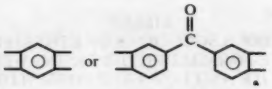
Division of Ser. No. 674,762, Apr. 8, 1976. This application Oct. 5, 1977, Ser. No. 839,411
Int. Cl.[2] C08G *73/14*
U.S. Cl. 260—32.6 NT **10 Claims**

1. A composition of matter comprising an imideforming material consisting essentially of a homogeneous solution of a stoichiometric adduct of:

(a) an N-substituted cyclic bisimide with terminal carboxyl groups of the formula

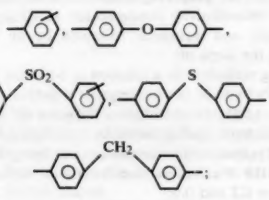


wherein x is 4 to 6 and A_2 is a tetravelent, aromatic radical of the formula

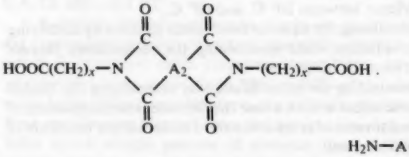


dissolved in a solvent to form a stable solution thereof; and

(b) one or more aromatic diamines capable of forming a polyimide by an exchange reaction with the terminal carboxyl groups of said bisimide upon the application of heat to said adduct, said aromatic diamine having the formula $H_2N—A_1—NH_2$ in which A_1 is a divalent aromatic radical selected from the group consisting of



said adduct being of the formula:



wherein A_1, A_2 and x have the above-indicated values.

4,183,839

POLYIMIDE RESIN-FORMING COMPOSITION

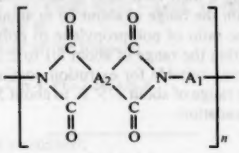
John Gagliani, San Diego, Calif., assignor to John V. Long, El Cajon, Calif., a part interest

Division of Ser. No. 674,762, Apr. 8, 1976. This application Oct. 5, 1977, Ser. No. 839,412

Int. Cl.[2] C08G *73/14*

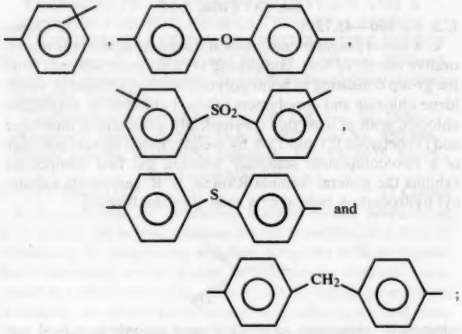
U.S. Cl. 260—37 N **10 Claims**

1. A process for preparing a polyimide of the formula:

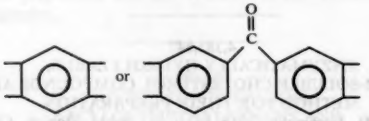


wherein

A_1 is a divalent aromatic radical selected from the group consisting of

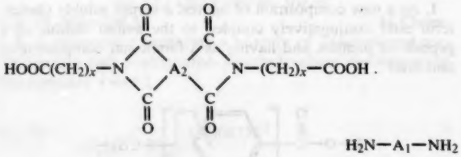


A_2 is a tetravalent, aromatic radical of the formula



n is a positive integer;

which comprises heating a homogeneous solution consisting essentially of an inert solvent and a stoichiometric adduct of the formula:



wherein x is 4–6 and A_1 and A_2 each have the above-indicated values to form said polyimide.

4,183,840

POLY(PHENYLENE SULFIDE) RESIN COATING COMPOSITION

Minoru Takahashi, Uji; Osamu Ishii, Takatsuki; Masanori Naito; Yoshinobu Kusuhara, both of Osaka, and Naofumi Imahigshi, Takatsuki, all of Japan, assignors to Sekisui Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Jan. 20, 1978, Ser. No. 870,999

Claims priority, application Japan, Jan. 21, 1977, 52-6003

Int. Cl.[2] C08K *3/22*

U.S. Cl. 260—37 R **5 Claims**

1. A poly(phenylene sulfide)resin coating composition comprising 100 parts by weight of a poly(phenylene sulfide) resin powder and 0.05 to 10 parts by weight of an aluminum oxide powder of colloidal size.

4,183,841

FILLED COMPOSITION CONTAINING PHENOL-ALDEHYDE RESIN AND BUTADIENE-ACRYLONITRILE POLYMER

Rudolph J. Danowski, Oxford, Conn., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jul. 16, 1965, Ser. No. 473,571

Int. Cl.[2] C08L *61/06*

U.S. Cl. 260—38 **8 Claims**

1. An improved char and erosion resistant ablative thermal insulator composition, which can be used for flexible combustion chambers which comprises:

(a) 70–140 parts by weight of a phenolic-aldehyde resin,

(b) 40–100 parts by weight of a filler selected from the group consisting of Group I and II metal phosphates, carbonates, acetates, oxalates and, sulfites, and

(c) 100 parts by weight of a butadiene-acrylonitrile polymer having an acrylonitrile content between about 20 and 45%.

4,183,842

METHOD FOR CLEAR-COLORING OF LINEAR AROMATIC POLYESTER

Seibei Ono, Nagaokakyo; Kouichi Shibuya, and Hiroshi Marikawa, both of Takatsuki, all of Japan, assignors to Dainippon Ink & Chemicals, Inc., Tokyo, Japan

Filed Jul. 18, 1977, Ser. No. 816,731

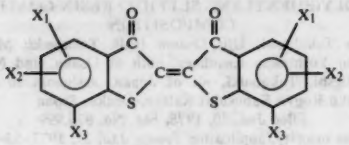
Claims priority, application Japan, Jul. 22, 1976, 51-86627; Mar. 30, 1977, 52-34667

Int. Cl.[2] C08K *5/48, 5/34*

U.S. Cl. 260—40 P **16 Claims**

1. A method for clear-coloring of a linear aromatic polyester having an intrinsic viscosity, measured at 25° C. in a mixture of equal amounts of tetrachloroethane and phenol, of 0.4 to 1.2, which comprises mixing at least one pigment selected from the group consisting of a pigment of the formula

and pigments of the formula



wherein X_1 and X_2 represent a hydrogen atom, a chlorine atom or a methyl group, and X_3 represents a chlorine atom or a methyl group and wherein the X_1, X_2 and X_3 moieties may be the same or different,

with a linear aromatic polyester, and heating the mixture to the melting temperature of the polyester to dissolve or substantially dissolve the pigment in the polyester.

4,183,843

PHOSPHATE ESTER COATING ON INORGANIC FILLERS FOR POLYESTER RESINS

James J. Koenig, Belleville, Ill., and H. Philip Hsieh, Murrysville, Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Sep. 20, 1978, Ser. No. 944,187
Int. Cl.[2] C08K *3/22, 3/32, 9/04*
U.S. Cl. 260—40 R **13 Claims**

1. A process for dispersing an inorganic filler in a polyester resin comprising:

lowering the viscosity of a polyester-filler dispersion, by coating the filler with 0.05 to 1.0 percent, based on the weight of the filler, of a polar phosphate ester containing acid groups and polar ether groups; and

after coating the filler, dispersing 40 to 65 percent of the filler, based on the total weight of resin and filler, with a polyester resin.

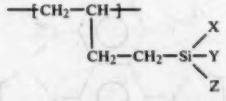
4,183,844

POLYMERIC ADHESION PROMOTERS FOR VULCANIZABLE MIXTURES OF ELASTOMERS AND MINERAL FILLERS

Roland Streck, Marl; Dieter Zerpner, Oer-Erkenschwick; Horst Haag, and Karl-Heinz Nordsiek, both of Marl, all of Fed. Rep. of Germany, assignors to Chemische Werke Huls Aktiengesellschaft, Marl, Fed. Rep. of Germany

Filed Jul. 26, 1977, Ser. No. 819,192
Claims priority, application Fed. Rep. of Germany, Aug. 7, 1976, 2635601
Int. Cl.[2] C07F *7/18, 7/08*
U.S. Cl. 260—42.15 **8 Claims**

1. A polybutadiene oil of molecular weight 400–6,000, having double bonds which are 10 to 60% vinyl, 1 to 15% transvinylene and 25 to 85% cis-vinylene, and 3–20% by weight, corresponding to 0.4–3% by weight of bound silicon, of which is reactive silyl polymer units of the formula



wherein X is halogen or alkoxy of up to 8 carbon atoms and Y and Z are X, H, alkyl of 1–8 carbon atoms, cycloalkyl of 5–12 carbon atoms, or carbocyclic aryl of up to 10 carbon atoms.

4,183,845

MELT EXTRUDABLE POLYPROPYLENE-POLYSTYRENE COMPOSITION AND METHOD

Theodore L. McGee, Appleton, Wis., assignor to American Can Company, Greenwich, Conn.

Filed Sep. 26, 1977, Ser. No. 836,835
Int. Cl.[2] C08L *23/14*
U.S. Cl. 260—42.46 **12 Claims**

1. A melt extrudable coating composition comprising a blend of polystyrene with a polypropylene compatible therewith and having a melt flow rate, as determined by ASTM-D1238-G, within the range of about 30 to about 40 grams per ten minutes, the ratio of polypropylene to polystyrene in the blend being within the range of about 5:1 to 2:1, the polymers of the blend being suitable for extrusion coating at melt temperatures in the range of about 475° F. to about 575° F. without substantial degradation.

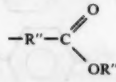
4,183,846

ORGANOTIN STABILIZER COMPOSITION

William A. Larkin, Morristown, and Robert C. Ringwood, Jr., Sewaren, both of N.J., assignors to M&T Chemicals Inc., Woodbridge, N.J.

Continuation-in-part of Ser. No. 709,910, Mar. 4, 1968, abandoned. This application May 10, 1971, Ser. No. 142,007
Int. Cl.[2] C08K *5/58*
U.S. Cl. 260—45.75 S **8 Claims**

1. A novel polymer composition stabilized against the deteriorative effects of heat, comprising (1) a polymer selected from the group consisting of homopolymers of vinyl chloride, vinylidene chloride and copolymers of vinyl chloride or vinylidene chloride with at least one ethylenically unsaturated monomer and (2) between 0.1 and 15% by weight, based on said polymer of a two-component stabilizer wherein the first component exhibits the general formula $RSn(SR')_3$ R′ represents a dodecyl hydrocarbon radical or a radical of the formula



wherein R″ represents an ethylene or a propylene radical and R‴ represents a monovalent hydrocarbon radical containing not less than 8 nor more than 12 carbon atoms, with the proviso that the weight ratio of said first component to said second component is between 2:1 and 20:1.

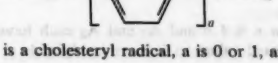
4,183,847

ENZYMATICALLY HYDROLYZABLE, SERUM-SOLUBLE CHOLESTEROL COMPOUNDS AND METHOD FOR THEIR PREPARATION

Arvind D. Deshmukh, 1011 Pearl St., Santa Monica, Calif. 90405

Division of Ser. No. 716,616, Aug. 23, 1976, Pat. No. 4,040,784. This application Apr. 15, 1977, Ser. No. 787,738
The portion of the term of this patent subsequent to Nov. 20, 1996 has been disclaimed.
Int. Cl.[2] C07G *7/00;* **G01N** *33/16*
U.S. Cl. 260—112 R **6 Claims**

1. As a new composition of matter, a serum soluble cholesterol ester conjugatively coupled to the amino residue of a peptide or protein, and having as a functional component of said ester



in which R is a cholesteryl radical, a is 0 or 1, and n is 1–30

when said ester is an amino ester and is 4–30 when said ester is an acid ester, said ester being soluble in serum in an amount equivalent to form at least 400 milligrams of cholesterol per 100 milliliters of cholesterol-free serum.

4,183,848

ANALGESIC POLYPEPTIDE

Victor M. Garsky, Radnor, Pa., assignor to American Home Products Corporation, New York, N.Y.

Filed Oct. 3, 1977, Ser. No. 838,688
Int. Cl.[2] C07C *103/52;* **A61K** *37/00*
U.S. Cl. 260—112.5 R **6 Claims**

1. A polypeptide of the formula:

L-Tyr-D-X-Gly-L-Phe-2-MeAla-R

in which

X is alanyl or methionyl;

and

R is —OH, —NH_2 or —NHC_nH_{2n+1} where n is 1, 2, 3 or 4 or a pharmaceutically acceptable salt thereof.

4,183,849

THERAPEUTIC INSULIN PREPARATION AND A PROCESS FOR THE PRODUCTION OF A STABLE INSULIN PREPARATION WITH PROTRACTED EFFECT

Bruno A. Hansen, Rodovre, and Finn H. Andresen, Hillerod, both of Denmark, assignors to Nordisk Insulinlaboratorium, Gentofte, Denmark

Continuation-in-part of Ser. No. 648,218, Jan. 12, 1976, abandoned. This application Dec. 8, 1977, Ser. No. 858,916
Claims priority, application Denmark, Jan. 15, 1975, 83/75
Int. Cl.[2] A61K *37/26*
U.S. Cl. 260—112.7 **17 Claims**

1. In a process for producing a stable insulin preparation with protracted action, wherein insulin is purified to a state of reduced or no antigenicity and then is reacted with an organic base containing amino groups in an aqueous medium maintained at a pH of about 6 to about 9, and the insulin preparation is isolated, the improvement comprising utilizing for said reaction with said organic base a medium containing a protein depolymerizing or protein dissociating stabilizer to maintain said purified insulin in a dissolved monomeric or loosely aggregated form during said reaction, thereby producing a stable insulin preparation with protracted action and reduced or no antigencity.

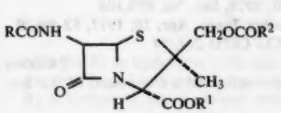
4,183,850

PROCESS FOR PREPARING 2-ACYLOXYMETHYLPENAMS AND 3-ACYLOXYCEPHAMS

Nicholas Darby, and Peter K. Wolfert, both of Edmonton, Canada, assignors to Connlab Holdings Limited, St. Laurent, Canada

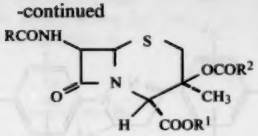
Filed Dec. 29, 1977, Ser. No. 865,572
Claims priority, application United Kingdom, Dec. 31, 1976, 54409/76
Int. Cl.[2] C07D *499/04, 501/02*
U.S. Cl. 260—239.1 **14 Claims**

1. A process for preparing a mixture of 2-(substituted methyl)penam and 3-substituted-3-methylcepham derivatives of the formulae 1 and 2



1

-continued



2

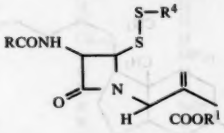
wherein

R represents the aliphatic, aromatic or heterocyclic moiety of an amino-protecting group commonly employed in penicillin chemistry and is selected from the group consisting of H; C_1–C_6 alkyl; phenyl; phenyl substituted in the o-, m-, or p-positions by CH_3, F, Cl, OCH_3, or a nitro group; benzyl; 2-thienylmethyl; tetrazol-(1-, 2-, or 5-)yl-methyl; phenoxymethyl; R^3O and R^3S wherein R^3 represents C_1–C_6 alkyl, phenyl, benzyl, or trichloroethyl; and 2-phenyl-5-methyl-isoxazol-4-yl; and RCONH may also represent the phthalimido or succinimido group;

R^1 is hydrogen or represents a carboxy-protecting group commonly employed in penicillin chemistry selected from the group consisting of C_1–C_6 alkyl, methoxymethyl, phenoxymethyl, benzyloxymethyl, trichloroethyl, benzyl, p-halobenzyl, p-nitrobenzyl, p-methoxybenzyl, benzhydryl, and trimethylsilyl; and

R^2 is selected from the group consisting of hydrogen; C_1–C_6 alkyl; C_1C_6 alkyl substituted with Cl, OCH_3, or CN; phenyl; and phenyl substituted in the o-, m-, or p-positions with CH_3, F, Cl, OCH_3, or NO_2,

which process comprises treating an unsym-azetidinone disulfide of the formula 3



3

wherein R and R^1 are as defined above, and R^4 is selected from the group consisting of benzothiazol-2-yl and benzoxazol-2-yl with an agent selected from silver oxide, an acid of the formula R^2COOH in which R^2 is as defined above and iodine, a silver salt of the formula R^2COOAg and iodine, in molar proportions of compound of formula 3 to silver oxide or silver salt to iodine of 1:1:1 to 1:3:1, and a Simonini complex of the formula $R^2COOI.R^2COOAg$ in molar proportions of compound of formula 3 to Simonini complex of 1:1 to 1:3, at a temperature within the range of 0°–50° C. for periods of time within the range of one minute to several hours, in an inert solvent selected from an aromatic hydrocarbon or a halogenated aliphatic hydrocarbon containing from 1–2 carbon atoms and from 2–4 atoms of chlorine or bromine, or an acid of the formula R^2COOH, and thereafter

isolating a mixture of the corresponding penam and cepham derivatives of formulae 1 and 2 in which R, R^1 and R^2 are as defined above.

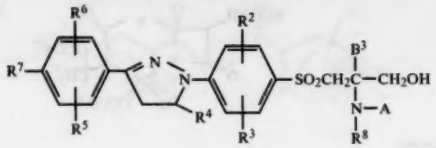
4,183,851

PYRAZOLINE COMPOUNDS

Manfred Patsch, and Albert Hettche, both of Ludwigshafen, Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Division of Ser. No. 702,975, Jul. 6, 1976, Pat. No. 4,129,563. This application Jun. 9, 1978, Ser. No. 913,949
Int. Cl.[2] C07D *231/06, 401/12*
U.S. Cl. 260—239.9 **5 Claims**

1. A pyrazoline compound of the formula



in which

B^3 is hydrogen or C_1 to C_4 alkyl,

R^2, R^3, R^5, R^6 and R^7 are independently hydrogen, chlorine, bromine, fluorine, methyl, ethyl, methoxy or ethoxy,

R^4 is hydrogen, C_1 to C_4 alkyl, benzyl, phenylethyl, phenyl or phenyl substituted by chlorine, bromine, methyl, ethyl, methoxy, ethoxy, cyano or hydroxysulfonyl,

R^8 is hydrogen, C_1- to C_4-alkyl or C_2 or C_3-alkyl substituted by hydroxy or C_1- to C_4-alkoxy and

A is C_2 or C_3 alkyl substituted by C_1 to C_4 dialkylamino, piperidino, pyrrolidino or hexamethyleneimino.

4,183,852

PROCESS FOR PREPARING 25-HYDROXYCHOLESTEROL

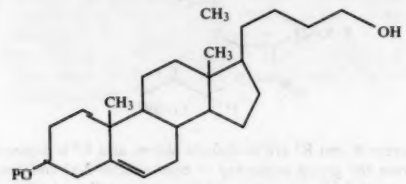
Emil T. Kaiser, 5634 S. Woodlawn Ave., Chicago, Ill. 60637

Filed Jul. 18, 1977, Ser. No. 816,478

Int. Cl.[2] C07J *17/00, 9/00*

U.S. Cl. 260—239.55 R **10 Claims**

1. A steroid compound having the structure



in which P is β-methoxyethoxymethyl.

4,183,853

1-[p-(2-TRIALKYLAMMONIUM)PROPYLSULFONYL-PHENYL]-3-(PHENYL)-PYRAZOLINE SALTS

Josef Schroeder, Leverkusen, and Carl-Wolfgang Schellhammer, Bergisch-Gladbach, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

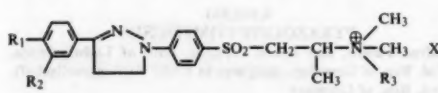
Filed Jan. 10, 1978, Ser. No. 868,317

Claims priority, application Fed. Rep. of Germany, Jan. 12, 1977, 2700996

Int. Cl.[2] C07D *231/06*

U.S. Cl. 260—239.65 **1 Claim**

1. A pyrazoline brightening agent of the formula



(I)

wherein

R_1 and R_2 denote hydrogen or chlorine,

R_3 denotes C_1–C_4-alkyl and

$X^{\ominus}$ denotes a colourless anion.

4,183,854

THIAZOLE COMPOUND

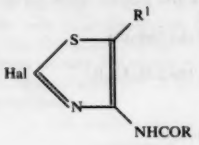
Roger Crossley, Reading, England, assignor to John Wyeth & Brother Limited, Maidenhead, England

Division of Ser. No. 799,911, May 23, 1977, Pat. No. 4,148,904, which is a continuation-in-part of Ser. No. 740,633, Nov. 10, 1976, abandoned. This application Jul. 28, 1978, Ser. No. 929,066

Int. Cl.[2] C07D *277/20*

U.S. Cl. 548—195 **3 Claims**

1. A compound of formula I



(I)

where Hal is chlorine or bromine, R^1 is hydrogen or methyl and R is ethenyl or cyclopropyl.

4,183,855

OXAZOLINOAZETIDINYLBUTYRIC ACID DERIVATIVES

Mitsuru Yoshioka; Shoichiro Uyeo, both of Toyonaka; Teruji Tsuji, Takatsuki; Yoshio Hamashima, Kyoto; Ikuo Kikkawa, Takarazuka, and Wataru Nagata, Nishinomiya, all of Japan, assignors to Shionogi & Co., Ltd., Osaka, Japan

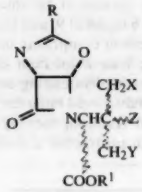
Filed Feb. 24, 1978, Ser. No. 881,054

Claims priority, application Japan, Feb. 25, 1977, 52-20468

Int. Cl.[2] C07D *498/04*

U.S. Cl. 260—307 F **1 Claim**

1. A compound of the formula



wherein R is phenyl, R^1 is diphenylmethyl, X is hydrogen, chlorine, bromine, or 1-methyl-tetrazolylthio, Y is hydroxy, formyloxy, t-butyldimethylsilyloxy, chlorine or bromine, and Z is hydroxy, phenylselenyl, trimethylsilyloxy, chlorine or bromine.

4,183,856

PROCESS FOR THE PRODUCTION OF UREA DERIVATIVES

Yasuo Makisumi, Kawanishi; Takashi Sasatani, Sakai, and Akira Murabayashi, Ibaraki, all of Japan, assignors to Shionogi & Co., Ltd., Osaka, Japan

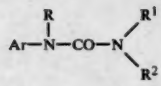
Filed Apr. 10, 1978, Ser. No. 895,105

Claims priority, application Japan, Apr. 28, 1977, 52-49629

Int. Cl.[2] C07D *261/14*

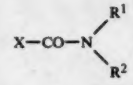
U.S. Cl. 548—246 **7 Claims**

1. A process for the production of a compound of the formula:



wherein Ar represents a member selected from the group consistng of (a) 3-isoxazolyl, (b) 2-thiazolyl, (c) 3-isothiazolyl, (d) 2-benzothiazolyl, (e) 2-pyridyl and (f) one of said groups (a) to (e) substituted by one or two substituents selected from the group of methyl, ethyl, propyl, i-propyl, butyl, i-butyl, t-butyl, pentyl, i-pentyl and phenyl; R represents hydrogen or C_1–C_6 alkyl; R^1 represents C_1–C_6 alkyl; and R^2 represents C_1–C_6 alkyl, C_2–C_6 alkenyl or C_1–C_6 alkoxy, which is characterized by reacting an amine of the formula:

wherein Ar and R are as defined above with a carbonyl halogenide of the formula:



wherein X represents a halogen atom and R^1 and R^2 are as defined above in the presence of a Lewis acid in an inert solvent.

4,183,857

3-BENZYL-3-AZABICYCLO(3.1.0)HEXANE-2,4-DIONE

Willy D. Kollmeyer, Modesto, Calif., assignor to Shell Oil Company, Houston, Tex.

Filed Jul. 6, 1978, Ser. No. 922,407

Int. Cl.² C07D *209/52*

U.S. Cl. 260—326.5 B **2 Claims**

1. 3-Benzyl-3-azabicyclo(3.1.0)hexane-2,4-dione.
2. 3-Benzyl-3-azabicyclo(3.1.0)hexane.

4,183,858

α-VINYL TRYPTOPHANES

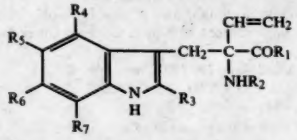
Brian W. Metcalf, Strasbourg, and Michel Jung, Illkirch Graffenstaden, both of France, assignors to Merrell Toraude et Compagnie, Strasbourg, France

Filed Jul. 1, 1977, Ser. No. 812,113

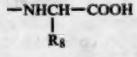
Int. Cl.² C07D *209/20;* A61K *31/405*

U.S. Cl. 260—326.14 T **8 Claims**

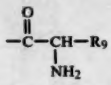
1. A compound of the formula



wherein R_1 is hydroxy, a straight or branched alkoxy group of from 1 to 8 carbon atoms, —NYY' wherein each of Y and Y' is hydrogen or a straight or branched lower alkyl of from 1 to 4 carbon atoms, or



wherein R_8 is hydrogen, a straight or branched lower alkyl group of from 1 to 4 carbon atoms, benzyl or p-hydroxybenzyl; R_2 is hydrogen, alkylcarbonyl wherein the alkyl moiety has from 1 to 4 carbon atoms and is straight or branched, alkoxycarbonyl wherein the alkoxy moiety has from 1 to 4 carbon atoms and is straight or branched or



wherein R_9 is hydrogen, a straight or branched lower alkyl group of from 1 to 4 carbon atoms, benzyl or p-hydroxybenzyl; R_3 is hydrogen or methyl; R_4, R_5, R_6 and R_7 have the meanings defined in Table I wherein R_{10} is hydrogen, a straight or branched alkyl group of from 1 to 8 carbon atoms, alkylcarbonyl wherein the alkyl moiety has from 1 to 6 carbon atoms and is straight or branched, benzoyl or phenylalkylenecarbonyl wherein the alkylene moiety has from 1 to 6 carbon atoms and is straight or branched, and halo is chlorine, fluorine, bromine or iodine;

TABLE 1

R_4	R_5	R_6	R_7
H	H	H	H
H	OR_{10}	OR_{10}	H
OR_{10}	H	H	H
H	OR_{10}	H	H
OR_{10}	H	OR_{10}	H
H	H	OR_{10}	H
OR_{10}	OR_{10}	H	H
CF_3	H	H	H
H	H	CF_3	H
H	halo	H	H
H	H	halo	H
H	halo	halo	H
halo	H	H	CH_3
OR_{10}	H	H	CH_3
H	OR_{10}	H	CH_3
H	H	OR_{10}	CH_3
H	H	H	halo
H	halo	H	halo
H	H	halo	halo
halo	H	H	halo
H	H	OR_{10}	halo
H	OR_{10}	H	halo
OR_{10}	H	H	halo
H	H	H	CF_3
H	OR_{10}	H	CF_3
H	H	halo	OR_{10}
H	OR_{10}	H	OR_{10}
H	halo	H	OR
OR_{10}	H	H	OR_{10}
halo	H	H	OR_{10}

or a pharmaceutically acceptable salt and individual optical isomers thereof.

4,183,859

THENOYLINDAN DERIVATIVES

Tetsuya Aono, Kyoto, and Yasuhiko Kawano, Suita, both of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

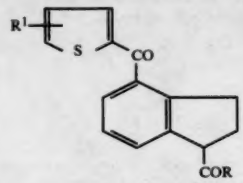
Filed Apr. 4, 1978, Ser. No. 893,303

Claims priority, application Japan, Apr. 6, 1977, 52-39792

Int. Cl.² C07D *333/24, 333/16;* A01N *9/00*

U.S. Cl. 549—72 **5 Claims**

1. A compound of the formula:



wherein R is hydroxyl, amino or a lower alkyl having 1 to 4 carbon atoms and R^1 is hydrogen or a lower alkyl having 1 to 4 carbon atoms.

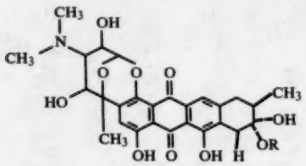
4,183,860

ANTIBIOTICS 7(S)-O-ALKYLNOGAROLS

Paul F. Wiley, Kalamazoo, and David J. Houser, Portage, both of Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Filed Jul. 17, 1978, Ser. No. 924,975
The portion of the term of this patent subsequent to Apr. 25, 1995, has been disclaimed.
Int. Cl.[2] C07D *319/08*
U.S. Cl. 260—340.3 **6 Claims**

1. Essentially pure 7(S)—O—alkylnogarol, a compound having the following structure:



V

wherein R is alkyl of from 1 to 4 carbon atoms, inclusive.

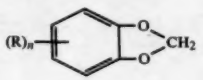
4,183,861

PROCESS FOR PREPARING AROMATIC METHYLENE-DIOXY COMPOUNDS

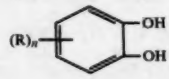
Paolo Maggioni, Cernusco Montecchia, Italy, assignor to Brichima S.p.A., Milan, Italy

Filed Jan. 31, 1977, Ser. No. 764,424
Claims priority, application Italy, Jan. 30, 1976, 19735 A/76
Int. Cl.[2] C07D *317/44*
U.S. Cl. 260—340.5 R **10 Claims**

1. A method for preparing a compound of the formula:



wherein R is hydrogen, alkyl of 1–4 carbon atoms, aldehydo, carboxy, alkoxy of 1–4 cations, halo or nitro; and n is an integer having a value of 1–3 which comprises treating a compound of the formula:



wherein R and n are as defined above, with methylene chloride, in the presence of a catalyst selected from among ammonium, phosphonium, or arsonium salts.

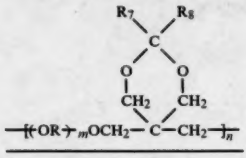
4,183,862

POLYCYCLIC POLYOXYALKYLENE COMPOUNDS

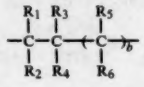
Edwin C. Steiner, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 510,872, Oct. 1, 1974, abandoned. This application May 2, 1978, Ser. No. 902,204
Int. Cl.[2] C07D *319/04*
U.S. Cl. 260—340.7 **13 Claims**

1. A compound represented by the formula



wherein m, each occurrence is independently zero or an integer from 1 to about 10, n is an integer from 1 to 4, $—R_7$ and $—R_8$ are independently hydrogen or lower alkyl, and —R— is an alkylene chain represented by the formula



where b is zero or one and R_1–R_6 are independently hydrogen or methyl, provided that the product of at least one m and n is at least 2.

4,183,863

CONVERSION OF CYCLOHEXANOL TO ε-CAPROLACTONE

David P. Higley, Katonah, and Philip F. Wolf, Pleasantville, both of N.Y., assignors to Union Carbide Corporation, New York, N.Y.

Filed Apr. 18, 1978, Ser. No. 897,511
Int. Cl.[2] C07D *313/04*; C07C *179/08*
U.S. Cl. 260—343 **8 Claims**

1. Method for the preparation of ε-caprolactone which comprises oxidizing cyclohexanol, and contacting the oxidized cyclohexanol with a catalytic amount of a selenium compound, having a valence of +4, selected from the group consisting of selenium dioxide, selenious acid, alkali metal salts of selenious acid, selenium halides, selenium oxyhalides, and dialkyl selenites having 1 to about 10 carbon atoms in each alkyl moiety, in the presence of at least 0.1 equivalent weights, per equivalent weight of selenium compound, of a base having a conjugate acid with a dissociation constant in the range of about 5×10^{-8} to bout 8×10^{-2}, in an inert solvent whereby the oxidation by +6 valence selenium of said oxidation products of cyclohexanol is inhibited, at a temperature of about 20° C. to about 200° C.

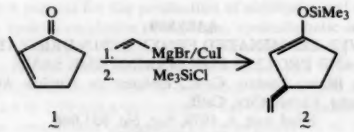
4,183,864

COBALT CATALYZED STEROID SYNTHESIS

K. Peter C. Vollhardt, and Raymond L. Funk, both of Berkeley, Calif., assignors to The United States of America as represented by the Department of Health, Education and Welfare, Washington, D.C.

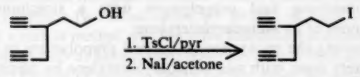
Filed Feb. 21, 1978, Ser. No. 879,492
Int. Cl.[2] C07J *1/00*
U.S. Cl. 260—397.3 **3 Claims**

1. A method of synthesizing the steroid 4-ring system which comprises reacting



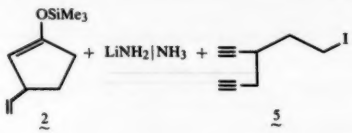
1 2

and simultaneously utilizing



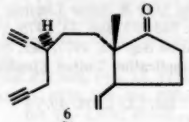
4 5

and reacting



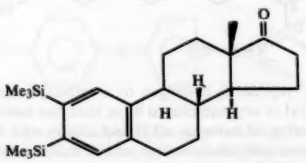
2 5

to give



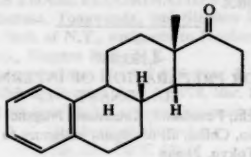
6

which is then reacted with BTMSA/$CpCo(CO)_2$ to give



7

which is treated with an acid to give



8

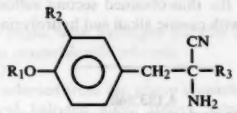
4,183,865

PROCESS FOR THE RESOLUTION OF RACEMIC α-AMINONITRILES

Marijan Hohnjec, Zagreb, and Miha Japelj, Novo Mesto, both of Yugoslavia, assignors to KRKA, farmacevtika, kemija, kozmetika, zdravilisca in gostinstvo, Novo mesto, n.sol.o., Novo Mesto, Yugoslavia

Filed Mar. 30, 1978, Ser. No. 891,974
Claims priority, application Yugoslavia, Apr. 8, 1977, 938/77
Int. Cl.[2] C07C *121/66*
U.S. Cl. 260—465 E **17 Claims**

1. Process for the resolution of racemic α-aminonitriles of the general formula:



(I)

wherein

R_1 stands for a hydrogen atom or a methyl group,

R_2 stands for a hydrogen atom or a methoxy group, and

R_3 stands for a hydrogen atom or a methyl group, into optically active enantiomers, which comprises:

(A) treating said racemic α-aminonitriles with (−)-dibenzoyl-tartaric acid in organic polar solvent in order to thereby obtain a macemic mixture of diastereoisomeric D and L salts of (−)-dibenzoyl-tartaric acid;

(B) macerating said racemic mixture of diastereoisomeric D and L salts of (−)-dibenzoyl-tartaric acid with dioxane or water/dioxane mixture containing at least 85% by volume dioxane to thereby obtain D- and L-aminonitrile (−)-dibenzoyl-bitartrate;

(C) neutralizing the L-form;

(D) extracting the neutralized product obtained in step (C) above with a chlorinated aliphatic hydrocarbon; and

(E) converting said neutralized product to a hydrochloride or acetyl derivative.

4,183,866

METHOD FOR PREPARING 3-CYANOPROPANOL AND 2-PYRROLIDONE

Victor P. Kurkov, San Rafael, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed May 22, 1978, Ser. No. 908,341
Int. Cl.[2] C07C *120/00, 121/34*
U.S. Cl. 260—465.6 **13 Claims**

1. A process for preparing 3-cyanopropanol which comprises contacting a liquid reaction mixture comprising 3-cyanopropanal with a stoichiometric excess of hydrogen at temperatures in the range of about from 50 to 250° C. and hydrogen pressures in the range of about from 1,000 to 5,000 psig in the presence of a catalytically effective amount of a copper-chromite catalyst, which has been prereduced via contact with a reducing agent selected from the group consisting of hydrogen, alkanols, cycloalkanols or mixtures thereof at elevated

temperatures to increase its selectivity, to yield said 3-cyanopropanol product.

4,183,867

METHOD FOR PREPARATION OF INTERNAL OLEFIN SULFONATE

Shizuo Sekiguchi, Funabashi; Katsumasa Nagano, Ichikawa, and Kyozo Kitano, Chiba, all of Japan, assignors to The Lion Fat & Oil Co., Tokyo, Japan

Filed Aug. 2, 1978, Ser. No. 930,424
Claims priority, application Japan, Aug. 25, 1977, 52-101905
Int. Cl.[2] C07C *143/02*
U.S. Cl. 260—513 T 5 Claims

1. The method for preparing internal olefin sulfonates which comprises:

(a) sulfonating an internal olefin with SO_3 gas at a molar ratio of less than 1.3 moles of SO_3 per 1 mole of said internal olefin, under conditions effective to produce a first sulfonation reaction mixture which contains from 10 to 20% by weight of unreacted internal olefin;

(b) adding anhydrous sodium sulfate and concentrated sulfuric acid having a concentration of 90% or more to said first sulfonation reaction mixture, under conditions effective to sulfonate said unreacted internal olefin to produce a second sulfonation reaction mixture, the amount of said anhydrous sodium sulfate being effective to minimize polymerization of said unreacted internal olefin; and

(c) neutralizing the thus-obtained second sulfonation reaction mixture with caustic alkali and hydrolyzing it thereafter.

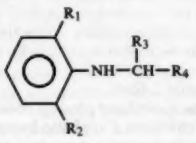
4,183,868

PROCESS FOR THE PREPARATION OF 2,6-DIALKYL-N-ALKYLANILINES

Paul Radimerski, Oberwil, and Milos Rusek, Binningen, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

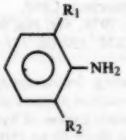
Filed Apr. 26, 1978, Ser. No. 899,903
Int. Cl.[2] C07C *85/06*; B01J *23/64*
U.S. Cl. 260—573 9 Claims

1. A process for the preparation of a 2,6-dialkyl-N-alkylaniline of the formula I



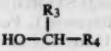
(I)

in which R_1 and R_2 independently of one another are each methyl or ethyl, R_3 is hydrogen, methyl or ethyl and R_4 is an alkyl group having 1 to 11 carbon atoms or an alkoxymethyl group having 1 to 8 carbon atoms in the alkyl group, which comprises reacting a 2,6-dialkylaniline of the formula II



(II)

in which R_1 and R_2 are as defined under formula I, in the presence of a copper-containing catalyst which contains 0.05 to 10% by weight of palladium or platinum, at 200° to 350° C., with an alcohol of the formula III



(III)

in which R_3 and R_4 are as defined under formula I.

4,183,869

ETHYNYL-TERMINATED EPOXY RESIN DERIVATIVES AND PROCESS FOR MAKING THE SAME

Norman Bilow, Encino, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Aug. 4, 1978, Ser. No. 931,086
Int. Cl.[2] C08L *63/10*
U.S. Cl. 260—573 8 Claims

1. A process for ethynylating polyfunctional epoxy prepolymers to form one component, long shelf life thermosetting resins comprising the steps of:

(a) premixing said prepolymers with a stoichiometric amount of an aminoarylacetylene;

(b) causing the epoxy groups on said prepolymers to completely react with said aminoarylacetylene by raising the temperature of said premix to about 120°–140° C. with agitation for a period ranging from 1 to about 8 hours whereby a molten acetylene terminated oligomer is formed; and

(c) allowing said molten oligomer to cool to ambient temperatures.

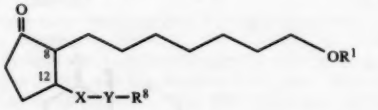
4,183,870

CYCLOPENTANE DERIVATIVES

Michael P. L. Caton, Upminster; Edward C. J. Coffee, London, both of England, and Gordon L. Watkins, Santa Monica, Calif., assignors to May & Baker Limited, Essex, England

Division of Ser. No. 543,552, Jan. 23, 1975, Pat. No. 4,088,695.
This application Sep. 22, 1977, Ser. No. 835,723
Claims priority, application United Kingdom, Jan. 26, 1974, 3730/74
Int. Cl.[2] C07C *49/76*
U.S. Cl. 260—590 C 6 Claims

1. A cyclopentane derivative of the formula:



I

wherein R^1 represents hydrogen or a carboxylic acyl group, and R^8 is aryl or aryl substituted by at least one member of the class consisting of halogen, alkyl and alkoxy of 1 through 6 carbon atoms, and trihalomethyl, and X and Y in the formula I represent simultaneously ethylene and carbonyl, trans-vinylene and carbonyl, or ethylene and —CH(OR[7])— groups respectively, where R^7 represents hydrogen or a carboxylic acyl group.

4,183,871

PRODUCTION OF ALDEHYDES AND ALCOHOLS BY THE OXO METHOD

Peter Tavs; Wilhelm Kniese, both of Limburgerhof, and Hans Nienburg, Ludwigshafen, all of Fed. Rep. of Germany, assignors to Badische Anilin-& Soda-Fabrik Aktiengesellschaft, Fed. Rep. of Germany

Continuation of Ser. No. 262,559, Jun. 14, 1972, abandoned, which is a continuation of Ser. No. 822,311, May 6, 1969, abandoned. This application Apr. 17, 1975, Ser. No. 568,930

Claims priority, application Fed. Rep. of Germany, May 9, 1968, 1768391

Int. Cl.[2] C07C *45/02*

U.S. Cl. 260—604 HF 9 Claims

1. In a process for the production of aldehydes and alchols by the hydroformylation of aliphatic, cycloaliphatic or araliphatic olefinically unsaturated compounds having up to twenty carbon atoms with carbon monoxide and hydrogen in a ratio by volume of carbon monoxide to hydrogen of from about 1:1 to 1:10 and a mole ratio of the CO/H_2 mixture to the olefinic unsaturated compound of from about 1:1 to 1:5 at a temperature of from 140° to 250° C. and at a pressure of from 30 to 350 atmospheres in the presence of a carbonyl complex of cobalt which has been modified by a trisubstituted phosphine, the improvement which comprises: using a carbonyl complex of cobalt which has been modified with a trisubstituted phosphine in which two substituents are methyl or ethyl, at least one of which is methyl, and the third substituent is an unsubstituted alkyl radical having from eight to thirty carbon atoms or an alkyl radical of eight to thirty carbon atoms substituted by hydroxyl groups or alkoxy groups of one to four carbon atoms, said substituent groups being inert under the reaction conditions the atomic ratio of cobalt to phosphorous in the catalyst being from about 1:1 to 1:6 and the weight ratio of cobalt to olefin being from 0.1 to 2.0:100.

4,183,872

POLYMER BOUND (PENTAHAPTOCYCLOPENTADIENYL)BISCARBONYL RHODIUM HYDROFORMYLATION CATALYST

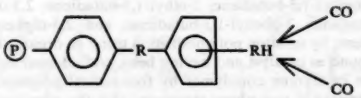
John T. Carlock, Ponca City, Okla., assignor to Conoco, Inc., Ponca City, Okla.

Division of Ser. No. 877,440, Feb. 13, 1978. This application Oct. 12, 1978, Ser. No. 950,763

Int. Cl.[2] C07C *45/08*

U.S. Cl. 260—604 HF 5 Claims

1. A method for converting olefins to aldehydes comprising converting said olefin in the presence of a catalyst having the structure



wherein R is zero or an alkyl group containing from 1 to 10 carbon atoms, and P represents a styrene polymer backbone, said conversion occurring at a temperature of from about 90° C. to 140° C. and pressures of from about 300 to about 5000 pounds per square inch gauge (psig) in the presence of mixtures of hydrogen and carbon monoxide.

4,183,873

LIQUID PHASE FLUORINATION PROCESS

Yusuf A. Baxamusa, Tonawanda, and Stephen Robota, North Tonawanda, both of N.Y., assignors to Hooker Chemicals & Plastics Corp., Niagara Falls, N.Y.

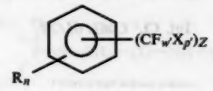
Continuation-in-part of Ser. No. 737,626, Nov. 1, 1976, Pat. No. 4,098,832. This application Jun. 5, 1978, Ser. No. 912,629

The portion of the term of this patent subsequent to Jul. 4, 1995, has been disclaimed.

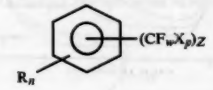
Int. Cl.[2] C07C *25/14*

U.S. Cl. 260—651 F 16 Claims

1. A process for the preparation of compounds of the formula



comprising contacting a compound or mixture of compounds of the formula



in the liquid phase, with hydrogen fluoride in the presence of molybdenum pentachloride wherein

Z is 1 or 2

each R is selected from the group consisting of aryl, substituted aryl, halogen, alkyl, alkoxy, substituted alkyl, and substituted alkoxy;

n is 0 to 5;

X is a halogen atom other than fluorine;

the maximum value of n+Z is 6;

w+p is 3;

w'+p' is 3;

with the proviso that

when Z is 1:

w is 0 to 1

p is 2 to 3

w' is 1 to 2, and is greater than w;

p' is 1 to 2, and is less than p;

and, when Z is 2:

the total value of w is 0 to 4

the total value of p is 2 to 6

the total value of w' is 1 to 5 and is greater than w

the total value of p' is 1 to 5 and is less than p.

4,183,874

SILANE END-CAPPED POLYARYLENE SHAPED ARTICLES AND MIXED RESINS

You-Ling Fan, East Brunswick, and Alford G. Farnham, Mendham, both of N.J., assignors to Union Carbide Corporation, New York, N.Y.

Division of Ser. No. 681,830, Apr. 30, 1976, Pat. No. 4,093,600. This application Apr. 19, 1978, Ser. No. 897,859

Int. Cl.[2] C08G *75/00, 65/48*

U.S. Cl. 525—100 10 Claims

1. A method of forming an adhesive bond between two substrates which comprises subjecting a composite comprising said two substrates and a layer between said substrates of the silane end-capped polyarylene polyether of the formula:

X—polyarylene polyether chain—X'

wherein X and X' individually represent silane end groups, wherein each silane end group contains at least one hydrolyzable substituent group or at least one silanol hydroxyl group, to

at least contact pressure and to a temperature of at least the glass transition temperature of said polyarylene polyether.

4,183,875

SUBSTITUTED MELAMINE ADDITIVES USEFUL IN MOLDING COMPOSITIONS BASED ON THERMOSETTING RESINS

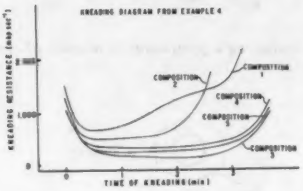
Michael Eckelt, Dusseldorf; Rudi Heyden, Erkrath; Manfred Jaeckel, Loxstedt; Manfred Petzold, Düsseldorf-Holthausen, and Kurt Worschech, Bexhovede, all of Fed. Rep. of Germany, assignors to Neynaber Chemie GmbH, Loxstedt, Fed. Rep. of Germany

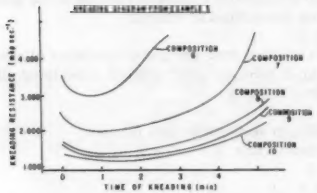
Filed Sep. 8, 1976, Ser. No. 721,371

Claims priority, application Fed. Rep. of Germany, Sep. 12, 1975, 2540616

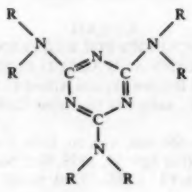
Int. Cl.[2] C08L *61/28*

U.S. Cl. 525—6 **10 Claims**





1. The process of shaping moldable composition based on thermosetting condensation resins selected from the group consisting of phenoplasts and aminoplasts which comprises the steps of adding at least one lubricant to said moldable composition, subjecting the lubricated moldable composition to the action of temperature and pressure in a shaping operation, and recovering a shaped non-fusible condensate, the improvement consisting of utilizing from 0.1% to 20% by weight of said moldable composition of a substituted melamine additive mixture of the formula:



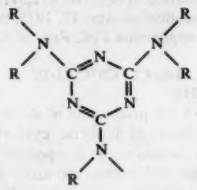
wherein the six R substituents represent members selected from the group consisting of the following:

(a) 0 to 3 R substituents are hydrogen,

(b) 1 to 5 R substituents are R′—OCH_2—, wherein R′ is a member selected from the group consisting of hydrogen, alkyl having from 1 to 4 carbon atoms, and mixtures thereof,

(c) 1 to 4 R substituents are members selected from the group consisting of R^2OCH_2—, R^2—$COOCH_2$—, R^2—$CONHCH_2$—, and mixtures thereof, wherein R^2 is a group having from 8 to 22 carbon atoms selected from the group consisting of alkyl, alkenyl, hydroxyalkyl, hydroxyalkenyl, phenylalkyl, and mixtures thereof, and

(d) 0 to 2 R substituents are members selected from the group consisting of Z—CH_2OCH_2—, Z—CH_2—, and mixtures thereof, wherein Z is a monovalent melamine group of the formula:



as said lubricant.

4,183,876

THERMOPLASTIC COMPOSITIONS OF POLYALKENAMER RUBBER AND POLYOLEFIN RESIN

Aubert Y. Coran, and Raman Patel, both of Akron, Ohio, assignors to Monsanto Company, St Louis, Mo.

Filed Nov. 27, 1978, Ser. No. 963,861

Int. Cl.[2] C08L *23/06, 23/12*

U.S. Cl. 525—232 **21 Claims**

1. A thermoplastic composition comprising a blend of about 15 to about 95 parts by weight thermoplastic crystalline polyolefin resin and about 85 to about 5 parts by weight crosslinked polyalkenamer rubber per 100 total parts by weight polyolefin resin and polyalkenamer rubber, in which the polyalkenamer rubber is cross-linked to the extent that no more than fifty weight percent of the rubber is extractable in boiling xylene.

4,183,877

HIGH-IMPACT POLYSTYRENE COMPOSITION AND PRODUCTION THEREOF

Toshio Ibaragi, Kawasaki; Kunio Satake, Yokohama; Tsuyoshi Yamada, Yokosuka, and Kiyoshi Hayakawa, Yokohama, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 685,149, May 11, 1976, abandoned. This application Apr. 3, 1978, Ser. No. 892,848

Claims priority, application Japan, May 12, 1975, 50-54656

Int. Cl.[2] C08F *279/02*

U.S. Cl. 525—70 **15 Claims**

1. A high-impact polystyrene composition comprising a major amount of (1) polystyrene or (2) a copolymer of styrene and at least one monomer copolymerizable with styrene, the amount of said monomer being at most 50% by weight based on the total weight of the styrene and the monomer, and a minor amount of a diene polymer, the diene polymer having been prepared from more than 50% by weight of 1,3-butadiene and less than 50% by weight of at least one conjugated diolefin selected from the group consisting of isoprene; 1,3-pentadiene; 2,3-dimethyl-1,3-butadiene; 2-ethyl-1,3-butadiene; 2,3-diethyl-1,3-butadiene; 2-phenyl-1,3-butadiene; and 2,3-diphenyl-1,3-butadiene; by solution polymerization using an organic lithium compound as catalyst and having been grafted onto the polystyrene or styrene copolymer by free-radical polymerization and forming a two-phase structure, and the diene polymer having a

(1) 1,2-vinyl content of more than 15 to 35% and cis-1,4 content of 20 to 45%, and

(2) Mooney viscosity (ML_{1+4}) of 25 to 85, solution viscosity of styrene containing 5% by weight of the diene polymer (SV) at 25° C. being 50 to 200 cps, and 1.5 $ML_{1+4} \leqq SV < 3.0$ ML_{1+4}.

4,183,878

HIGH IMPACT POLYSTYRENE RESIN

Harry A. Biletch, Lexington; Rodney Route, Leominster, both of Mass., and Jack Zomlefer, Plantation, Fla., assignors to Solar Chemical Corporation, Leominster, Mass.

Continuation of Ser. No. 655,546, Feb. 5, 1976, abandoned, which is a continuation-in-part of Ser. No. 408,172, Oct. 19, 1973, abandoned. This application Jul. 26, 1978, Ser. No. 928,102

Int. Cl.[2] C08F 279/02

U.S. Cl. 525—86 10 Claims

1. A method for the preparation of an impact resistant polystyrene resin which comprises copolymerizing a styrene monomer and 1 to 15% of an essentially uncrosslinked natural or synthetic rubber in a bulk-suspension system wherein the reaction in the bulk step is initiated thermally in the absence of any initiator compound but in the presence of a molecular weight modifier and continued to phase inversion, the system then being suspended in water and the reaction continued in the presence of an unsymmetrical peroxy-free azo catalyst of the structure R—N=N—R′ where R and R′ are different radicals and the R radical is selected from C_2 or higher alkyls, substituted C_1 or higher alkyls, cycloalkyls, aryl-substituted alkyls and substituted cycloalkyls and substituted aryl-substituted alkyls and being characterized by being capable of initiating styrene monomer polymerization and abstracting hydrogen from a natural or synthetic rubber, and the R′ radical is selected from alkyl radicals in which the radical carbon carries a substituent selected from nitrile, nitro, aromatic, substituted aromatic, methoxy and halogen groups and being characterized by a resonance stabilization equivalent to the resonance stabilization in the styryl radical and being capable of initiating the polymerization of styrene but not capable of abstracting hydrogen from a natural or synthetic rubber, said R and R′ radicals being further characterized by having reactivities of 2 to 9 and 0.1 to 2 respectively on a reactivity scale in which the benzoyloxy free radical has a reactivity rating of 14 and the isobutyronitrile free radical has a reactivity rating of 0.6.

4,183,879

DIPHOSPHONIC ACIDS AND ESTERS OF PARA-MENTHANE

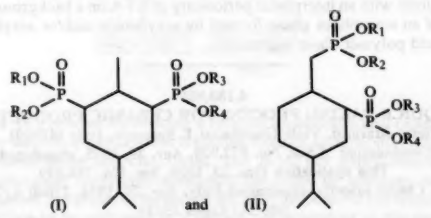
David R. Battiste, Bartlesville, Okla., assignor to SCM Corporation, New York, N.Y.

Filed Jul. 13, 1978, Ser. No. 924,165

Int. Cl.[2] C07F 9/38, 9/40

U.S. Cl. 260—932 7 Claims

1. A compound selected from



(I) and (II)

where R_1, R_2, R_3, and R_4, independently, are hydrogen or a C_1–C_{10} alkyl group.

4,183,880

PREPARATION OF O,O-DIALKYL-S-(N-METHYLCARBOXAMIDOMETHYL)-THIOLPHOSPHORIC ACID ESTERS

Egon Kohler, Dormagen, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Dormagen, Fed. Rep. of Germany

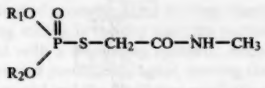
Filed Nov. 30, 1977, Ser. No. 856,456

Claims priority, application Fed. Rep. of Germany, Dec. 9, 1976, 2655823

Int. Cl.[2] C07F 9/165

U.S. Cl. 260—970 9 Claims

1. A process for the preparation of an O,O-dialkyl-S-(N-methyl-carboxamidomethyl)-thiolphosphoric acid ester of the formula



in which

R_1 and R_2 each independently is alkyl, comprising reacting a salt of N-methylcarboxamidomethyl-thiosulphuric acid with an O,O-dialkyl phosphorous acid of the formula

in a suspension in a non-polar solvent in the presence of an alkali metal carbonate or alkaline earth metal carbonate.

4,183,881

FLASH FIBRILLATION PROCESS

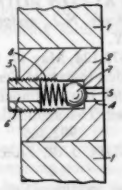
Brian P. Griffin; Alan W. Jukes, both of St. Albans, and Cyril S. Wilkins, Welwyn Garden City, all of England, assignors to Imperial Chemical Industries Limited, London, England

Filed Sep. 21, 1977, Ser. No. 835,287

Claims priority, application United Kingdom, Jul. 20, 1977, 30456/77

Int. Cl.[2] D01F 7/00

U.S. Cl. 264—13 7 Claims



1. A flash fibrillation process for converting thermoplastics materials into fibrils wherein a pressurised dispersion of thermoplastics material and liquid is ejected through an outlet within which is located a pressure-responsive valve set to respond to the pressure of the dispersion in the entrance portion of the valve such that if the pressure falls below a predetermined level which is not below the level required to stop the liquid volatilising, the valve at least partially closes and if the pressure rises above the predetermined level the valve opens.

4,183,882

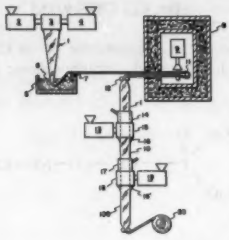
SELF-WELDING PACKAGING FILM

Alan S. Weinberg, Greenville, and Joseph Z. Sun, Spartanburg, both of S.C., assignors to W. R. Grace & Co., Duncan, S.C.

Division of Ser. No. 868,158, Jan. 9, 1978. This application Mar. 20, 1978, Ser. No. 888,074

Int. Cl.[2] B32B *27/08*

U.S. Cl. 264—22 8 Claims



6. A process for making a self-welding packaging film comprising the steps of:

(a) blending at least two polymeric resins, each of said resins comprising a copolymer of ethylene vinyl acetate, each copolymer having a different vinyl acetate content and the melt flow of one of said copolymers being in the range of 0.25 to 5.0 and the melt flow of another of said copolymers being greater than 28.0, the higher melt flow copolymer comprising 5% to 70% by weight of the blend and the lower melt flow copolymer comprising 95% to 30% by weight of the blend;

(b) coextruding said blend in tubular form with at least one other polymeric material to form a multi-wall tube, said copolymer blend forming the inner wall of said tube, at least one of said other polymeric materials being cross-linkable by irradiation;

(c) cooling and collapsing said tube;

(d) irradiating said tubing to induce cross-linking in the polymeric materials comprising said multi-wall tube;

(e) heating said tubing to the orientation temperature range of one of said cross-linked materials;

(f) expanding said tubing to film thickness in a trapped bubble;

(g) rapidly cooling said expanded tubing after it has been expanded to cool said blend below its self-welding temperature; and,

(h) collapsing said expanded tubing.

4,183,883

METHOD OF ROTATIONAL MOLDING ABOUT PLURAL AXES AT LOW ROTATIONAL SPEEDS

Edgar A. Blair, Cranbury, N.J., assignor to Monster Molding, Ltd., Brooklyn, N.Y.

Division of Ser. No. 471,124, May 17, 1974, Pat. No. 4,104,357, which is a continuation-in-part of Ser. No. 322,457, Jan. 10, 1973, abandoned, which is a continuation of Ser. No. 105,099, Jan. 8, 1971, abandoned. This application May 3, 1978, Ser. No. 902,365

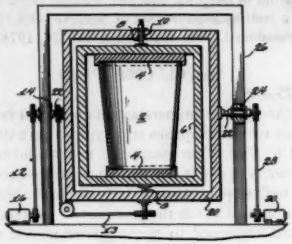
Int. Cl.[2] B29C *5/04, 5/08;* B29D *3/02*

U.S. Cl. 264—40.1 6 Claims

1. A process for low rotational velocity molding at ambient temperatures or up to 100° C. of an object or shape comprising:

(a) mixing a liquid thermosetting polymer or a liquid prepolymer with a curing agent capable of hardening the thermosetting polymer or prepolymer at ambient temperature to form a thermosetting polymer system, and a reinforcing agent such as fiberglass and placing the resulting liquid polymer system with reinforcing agent into a mold, in combination with

(b) moving said mold, said moving consisting of rotating said mold about two axes at such low rotational velocity, at ambient temperatures such that the centrifugal force on said mixture is negligible and adjusting the rotational velocity about each axis such that, upon observation, a uniform distribution of said polymer is obtained thereby



causing the polymer system to be distributed uniformly over and to coat the walls of the mold taking the form thereof, and continuing the rotation until the liquid polymer system hardens, and

(c) removing a solid shape thus produced from the mold.

4,183,884

METHOD FOR MANUFACTURING HYDROGEL TUBES

Otto Wichterle, and Artur Stoy, both of Prague, Czechoslovakia, assignors to Ceskoslovenska akademie ved, Prague, Czechoslovakia

Continuation-in-part of Ser. No. 432,515, Jan. 11, 1974, abandoned. This application Nov. 1, 1976, Ser. No. 737,051

Claims priority, application Czechoslovakia, Jan. 24, 1973, 533/73

Int. Cl.[2] B05D *3/00*

U.S. Cl. 264—41 10 Claims

1. The method of forming an elastic hydrophilic tube from a rubbery-hydrogel, consisting of the steps of:

(a) contacting an acrylonitrile containing polymer with a solvent solution of an acid or a salt, wherein said solvent is selected from the group consisting of mineral acids and salts capable of dissolving polyacrylonitrile, and subjecting said polymer to controlled partial acid hydrolysis in said solvent, terminating said acid hydrolysis and coagulating the solution of said polymer in a pre-extrusion coagulating bath, and redissolving the coagulated polymer in an organic solvent,

(b) extruding the acid hydrolyzed polymer solution in the form of a tube, while feeding a coagulating bath into the interior of the formed tube, into an aqueous coagulation bath, said polymer solution being viscous in form,

(c) treating and super-hydrophilizing the surface of the formed tube, while in a swollen state, with a hydrolyzing agent,

wherein said polymer is a multi-block copolymer of acrylonitrile with acrylamide, which under X-ray diffraction analysis reveals a pattern of crystalline or quasi-crystalline polyacrylonitrile with an interplanar periodicity of 5.1 A on a background of an amorphous phase formed by acrylamide and/or acrylic acid polymer chain segments.

4,183,885

QUICK BAKING PROCESS FOR CERAMIC PRODUCTS

Pietro Marazzi, Viale Giacobazzi 1, Sassuolo, Italy (41049)

Continuation of Ser. No. 572,939, Apr. 29, 1975, abandoned. This application Dec. 23, 1976, Ser. No. 754,039

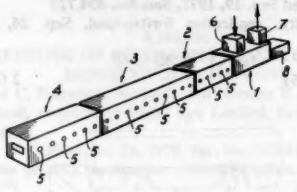
Claims priority, application Italy, Apr. 29, 1974, 22040 A/74

Int. Cl.[2] C04B *33/24*

U.S. Cl. 264—58 13 Claims

1. A process for the production of ceramic tiles, each having a front face and a rear face, comprising the steps of preparing

a raw tile consisting of a dry, unfired tile body with a dried glaze coating on one face of the body, and with the body consisting predominantly of clay and containing more than 40% by weight of raw clay, an aggregate calcium oxide and magnesium oxide content of less than 30% by weight and aluminum oxide content of less than 30% by weight wherein said raw clay is free of amounts of talcum and wollastonite exceeding 50% by weight, and an iron oxide content of less than 10% by weight; advancing the raw tile at a speed of the order of 1.5–2 meters per minute through a heat treatment chamber; in a heating step having a duration of 4–8 minutes, contacting both faces of the tile body concurrently with flowing hot gases as the tile body advances through the treatment



chamber to raise both faces concurrently and, by substantially only direct convection heating, substantially to firing surface temperature; in a subsequent firing step having a duration of 11–20 minutes, contacting both faces of the tile body concurrently with the flowing hot gases as the tile body continues to be advanced through the treatment chamber to maintain both surfaces substantially at the firing surface temperature concurrently, by substantially only direct convection heating, to fire the tile body and the glaze of the raw tile; and, following completion of the firing step, finally cooling the fired tile in a cooling step having a duration slightly shorter than that of the firing step; whereby the sum of the duration of the heating and firing steps is not in excess of about 28 minutes and the overall heating, firing, and cooling time is not in excess of 48 minutes.

4,183,886

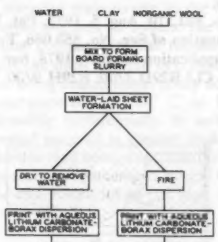
CHEMICAL METHOD FOR EMBOSSING A CERAMIC ACOUSTICAL PRODUCT

John R. Garrick, Lancaster, Pa., assignor to Armstrong Cork Company, Lancaster, Pa.

Filed Nov. 18, 1974, Ser. No. 524,772

Int. Cl.[2] C04B *33/34*

U.S. Cl. 264—62 **8 Claims**



1. In a process for forming a ceramic acoustical board product wherein a wet-laid mat is formed from an aqueous slurry of mineral fibers and clay, dried, and fired; the improvement comprising: chemically embossing the board by applying an aqueous dispersion of borax and lithium carbonate to the board surface to be embossed in a pattern corresponding to the desired embossed pattern, firing the printed board at a temperature sufficient to react the borax and lithium carbonate so as to form a fluid which is absorbed by the voids in the surface of the board, and which acts to dissolve mineral wool and clay in the board causing a subsequent embossing of the board surface adjacent the application point of said dispersion, and cooling the board to solidify the fluid and form a glassy material integral with the board substrate.

4,183,887

METHOD FOR PRODUCING FREE FLOWING PARTICLES OF ELASTOMERIC MATERIAL

Rudolph F. Karg, Baton Rouge, La., assignor to Copolymer Rubber & Chemical Corporation, Baton Rouge, La.

Filed Apr. 28, 1977, Ser. No. 791,696

Int. Cl.[2] B22D *23/08*

U.S. Cl. 264—130 **9 Claims**

1. The method of producing free flowing elastomeric particles comprising mixing in the dry state the particles of elastomeric material with a fibrillating synthetic resinous material and a finely divided partitioning agent, moving the particles of elastomeric material and the fibrillating synthetic resin relative to each other in a dry mixing operation at elevated temperature and in the presence of the partitioning agent whereby the synthetic resinous material fibrillates to form a porous network on the surface of the particles of elastomeric material in which the partitioning agent becomes entrapped to be retained in position to maintain separation for free flow of the elastomeric particles.

4,183,888

METHOD OF COATING WIRE

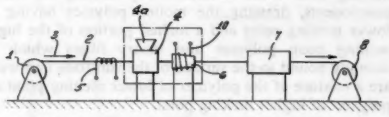
Diethelm Mutzke, Schulenburg, Fed. Rep. of Germany, assignor to Kabel-und Metallwerke Gutehoffnungshutte AG, Hanover, Fed. Rep. of Germany

Filed Aug. 23, 1973, Ser. No. 390,893

Claims priority, application Fed. Rep. of Germany, Aug. 30, 1972, 2242655

Int. Cl.[2] B29F *3/10*

U.S. Cl. 264—131 **5 Claims**



1. Method for providing a plastic coating of electrically insulative plastic on a continuously, horizontally running metal wire comprising the steps of:

heating progressive portions of the wire;

continuously depositing powder of such plastic material onto the heated portions of the horizontally running and extending wire by pouring such powder onto the wire from above;

passing the wire with powder adhering thereto through a funnel shaped heating chamber, wherein the wire encounters chamber space narrowing radially progressively in direction of passing, for heating and melting the powder completely, the melted plastic as carried along on the wire and encountering narrowing portions of the funnel-shaped chamber forming a bulge around the wire inside of the chamber, so that the melted powder is being uniformly distributed as a layer about the wire when leaving the chamber; and

withdrawing the wire from the chamber for further processing while stripping excess plastic off the wire in that the wire passes through a relatively narrow opening of the chamber upon leaving the chamber at a relatively narrow end thereof;

the narrow dimensions of the chamber end where the wire leaves the chamber determining the thickness of the layer.

4,183,889

METHOD FOR THE PRODUCTION OF A POLYMER SUBSTRATE WITH A FIBROUS SURFACE

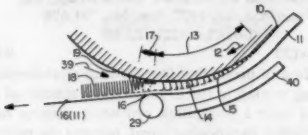
Hugo Brendel, Memmingen, Fed. Rep. of Germany, assignor to Metzeler Schaum GmbH, Memmingen, Fed. Rep. of Germany

Continuation of Ser. No. 667,621, Mar. 17, 1976, abandoned. This application Jan. 9, 1978, Ser. No. 868,119

Claims priority, application Fed. Rep. of Germany, Mar. 22, 1975, 2512772

Int. Cl.[2] B29C *17/00;* B29F *5/00*

U.S. Cl. 264—134 11 Claims



1. A process for producing a self-supporting polymer substrate having a binary pile surface, comprising:

(a) providing an unsupported composite film comprising a polymer of lower melting point upon a polymer of higher melting point, said polymer of higher melting point having a thickness of at least about 50 microns and being compatible with said polymer of lower melting point;

(b) drawing the film past a heated drawing surface and through a melting zone;

(c) heating the film in the melting zone by means of the heated drawing surface until the polymer of lower melting point and at least a portion of the thickness of the polymer of higher melting point become molten, at least a thickness of 20 microns of the polymer of higher melting point remaining unmelted, whereby the unmelted, part of the polymer of higher melting poing is a substrate which is covered with a film of the molten components; and

(d) deflecting the substrate which is covered with the film of molten components from the drawing surface and the melting zone while simultaneously cooling the molten components, drawing the molten polymer having the lower melting point and a melted portion of the higher melting point polymer into binary fibers which are strongly bound to the surface of the substrate and which are a mixture of the polymer of lower melting point and polymer of higher melting point.

4,183,890

METHOD OF CUTTING HOLLOW FILAMENTS EMBEDDED IN RESINOUS MASS

Wayne A. Bollinger, Cary, N.C., assignor to Monsanto Company, St. Louis, Mo.

Filed Nov. 30, 1977, Ser. No. 855,846

Int. Cl.[2] B32B *31/00*

U.S. Cl. 264—139 10 Claims

1. In a method for preparing a fluid separation apparatus comprising polymeric, semi-permeable hollow filaments wherein at least one end segment of each of the hollow filaments is secured in a substantially fluid-tight relationship in a sealing means comprising curable resin capable of achieving high structural strength, the improvement comprising embedding the hollow filaments in a substantially liquid, curable resin; partially curing the resin under curing conditions which are not unduly deleterious to the hollow filaments to provide a solid, partially-cured resinous mass having the hollow filaments embedded therein, said partially-cured resinous mass having sufficient structural integrity that it can be cut without undue non-elastic flowing of the resinous mass but does not have a hardness which renders the cutting difficult; cutting the partially-cured resinous mass generally transverse to the orientation of the hollow filaments with a sharp knife edge, said cutting exposing the bores of the hollow filaments and providing an openness of at least about 70 percent and said cutting being conducted at temperatures below those which unduly soften the hollow filaments such that the hollow filaments tend to smear closed during cutting; and subjecting the cut, partially-cured resinous mass to curing conditions to substantially fully cure the resinous mass.

4,183,891

METHOD FOR FOLDING SHEET-SHAPED PLASTIC MATERIAL AND FOLDED SHEET-SHAPED PLASTIC MATERIAL OBTAINED BY CARRYING OUT THIS METHOD

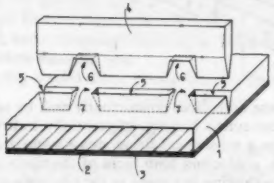
Jean-Claude M. M. Rossollin, Chamonix-Mont-Blanc, France, assignor to United Patents Trust Reg.-U.P.T., Liechtenstein

Filed Sep. 19, 1977, Ser. No. 834,725

Claims priority, application Switzerland, Sep. 24, 1976, 12109/76

Int. Cl.[2] B28B *1/48*

U.S. Cl. 264—154 2 Claims



1. A method for folding sheet-shaped plastic material comprising the steps of, forming a plurality of weakening grooves in the material along a longitudinal weakening line of the material, said grooves being separated from each other by unweakened material of the sheet, the length of the unweakened material separating the weakening grooves being dimensionally variable to provide an adjustable resistance to folding of the material along the weakening line, and folding the material along the weakening line to draw out the unweakened material separating the weakening grooves to form reinforcing ribs disposed transverse to the weakening line and in the dihedral angle of folding.

4,183,892

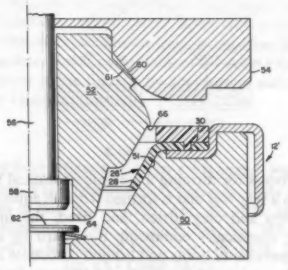
METHOD OF WORKING A SHAFT SEAL

George L. Corsi, Southfield, and Stanley N. Smith, Farmington, both of Mich., assignors to Federal-Mogul Corporation, Southfield, Mich.

Division of Ser. No. 822,110, Aug. 5, 1977, Pat. No. 4,132,421, which is a continuation of Ser. No. 550,066, Feb. 14, 1975, abandoned. This application May 17, 1978, Ser. No. 906,545

Int. Cl.[2] B29D *3/00;* B29H *9/00*

U.S. Cl. 264—263 2 Claims



1. A method of making an oil seal element comprising the

steps of: placing a metal cup shaped case having an axial outer flange and a radial flange into a lower mold member, thereafter placing a flexible annular seal element having a flat outer radial part bearing against the radial flange of the metal case, and an annular elastomeric prep material, onto the radial flange of the cup shaped case, in that order,

the annular seal element having at least one hole extending through the flat outer radial part and exposing a portion of the radial flange of the cup shape case to the prep;

closing the mold to form a mold cavity,

simultaneously applying heat to the prep and causing it to flow to the metal case including through said at least one hole to thereby bond the seal element to the cup shape case.

4,183,893

METHODS OF PRODUCING ORIENTED HIGH DENSITY POLYETHYLENE

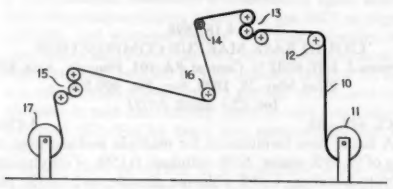
Michael C. Eastwood, Northolt, and Norman E. King, London, England, assignors to Metal Box Limited, Berkshire, United Kingdom

Filed Jul. 24, 1978, Ser. No. 927,410

Claims priority, application United Kingdom, Jul. 22, 1977, 30913/77

Int. Cl.² B29C *17/02*

U.S. Cl. 264—288.4 **7 Claims**



7. In a method for producing a uniaxially oriented high density polyethylene film wherein the film is continuously transported in a longitudinal direction through a drawing zone between respective sets of tensioning rollers and drawing rollers and drawing is induced in the longitudinal direction in the zone at elevated temperatures, the improvement comprising passing a high density polyethylene sheet material extending in the longitudinal direction and transverse thereto and having a density of 0.94 gm/cm^3 or higher through a drawing zone consisting of at least one tubular heating member heated internally and disposed transversely to the drawing direction between the respective sets of rollers, the material continuously passing into contact with the tubular heating member and being heated, the sheet material in contact with the tubular heating member being heated transversely across from edge to edge to a temperature of from 80° C. to 110° C. to induce longitudinal drawing preferentially in and adjacent to the transversely heated material in contact with the tubular heating member, the drawing being controlled to give a draw ratio of 5:1 or higher and to impart improved gas barrier and weathering resistance characteristics to the high density polyethylene material.

4,183,894

MANUFACTURE OF FASTENERS USING DIRECTIVE HEATING DURING STRETCHING

Joseph R. Paradis, Wayland, Mass., assignor to Dennison Manufacturing Company, Framingham, Mass.

Filed Jul. 18, 1977, Ser. No. 816,842

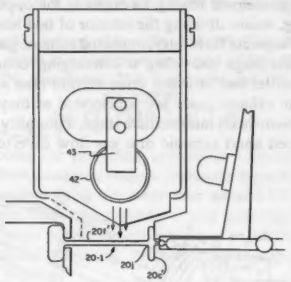
Int. Cl.² B29C *17/02*

U.S. Cl. 264—291 **12 Claims**

1. The method of manufacturing an assemblage of fasteners which comprises the steps of

(a) molding the assemblage as a set of connected individual fasteners, each including an end member which is joined by a filament, and

(b) stretching the individual fasteners simultaneously while



subjecting them to controlled heating at the junctions of their filaments with their end members, with said controlled heating being directed to the filaments simultaneously.

4,183,895

PROCESS FOR TREATING ANISOTROPIC MELT-FORMING POLYMERIC PRODUCTS

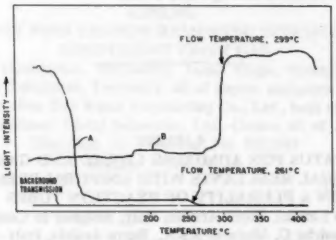
Robert R. Luise, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation of Ser. No. 625,133, Oct. 23, 1975, abandoned. This application Dec. 6, 1977, Ser. No. 858,025

Claims priority, application Sweden, Apr. 29, 1975, 7504996; May 5, 1975, 7505189

Int. Cl.² B29C *25/00*

U.S. Cl. 264—345 **12 Claims**



1. A process for strengthening oriented fibers extruded from the melt of an optically anisotropic-melt-forming polymer and having a tenacity of at least 1 gram per denier comprising heating said fibers in an inert atmosphere while they are essentially relaxed at temperatures below the fiber flow temperature, for a period of at least about five seconds and sufficient to increase the tenacity of the fibers by at least 50% to at least 10 grams per denier.

4,183,896

ANTI-POLLUTION DEVICE FOR EXHAUST GASES

Donald C. Gordon, 2220 Phillips Dr., Northglenn, Colo. 80233

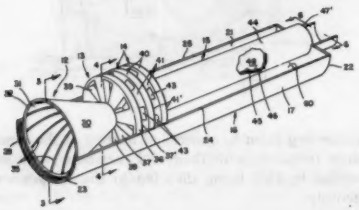
Continuation-in-part of Ser. No. 880,085, Feb. 22, 1978, abandoned, which is a continuation of Ser. No. 696,774, Jun. 16, 1976, abandoned. This application Jul. 17, 1978, Ser. No. 925,218

Int. Cl.² C01B *17/82, 17/84*

U.S. Cl. 422—168 **23 Claims**

1. An anti-pollution device for treatment of the exhaust gases of an internal combustion engine powered vehicle comprising

an elongated housing, an exhaust gas intake element at a first inlet end of said housing adapted for connection to the exhaust manifold of said internal combustion engine whereby exhaust gases are delivered to the interior of said housing, an exhaust gas discharge element having an outlet at the opposite end of said housing, means dividing the interior of said housing into a plurality of separate flow interconnected exhaust gas treatment stages, a first stage providing a converging cone structure having an outlet end of lesser cross section than an inlet end whereby the exhaust gases are accelerated as they are delivered to a downstream intermediate stage, a plurality of longitudinally spaced apart ceramic disc gas flow diverter elements



disposed at and defining said intermediate stage with each of said disc diverter elements providing a central opening with slots through said disc extending radially therefrom for the passage and expansive flow of said exhaust gases, and a downstream cooling stage for the reception and cooling of exhaust gases that have passed said intermediate stage, said cooling stage including a flow pipe disposed within said elongated housing and spaced from a wall portion thereto to provide a chamber intermediate said cooling pipe and said housing wall portion, said discharge element being interconnected with said flow pipe of said cooling stage whereby the treated exhaust gases are released through said outlet.

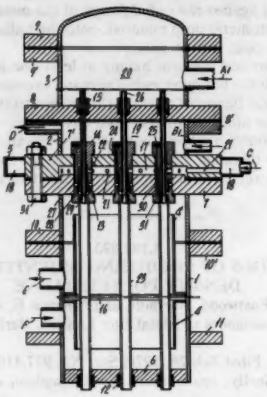
4,183,897

APPARATUS FOR ADMIXING LIQUID AND GASEOUS CHEMICAL REACTANTS WITH UNIFORM PRESSURE IN A PLURALITY OF REACTION TUBES

Agostino Lanteri, Busto Arsizio, Italy, assignor to Costruzioni Meccaniche G. Mazzoni S.p.A., Busto Arsizio, Italy

Division of Ser. No. 451,200, Mar. 14, 1974, Pat. No. 3,931,273, which is a continuation of Ser. No. 114,973, Feb. 12, 1971, abandoned. This application Dec. 11, 1975, Ser. No. 639,971
Claims priority, application Italy, Feb. 23, 1970, 20991 A/70
Int. Cl.[2] B01J *10/00;* **C07C** *143/00*
U.S. Cl. 422—197 **2 Claims**

1. Apparatus for continuously reacting a liquid material with a gas comprising a plurality of parallel reaction tubes, a single feed chamber for the liquid reactant, a single feed chamber for the gas reactant, means for metering and introducing said liquid reactant from its associated said chamber circumferentially into each of said tubes, nozzles for metering and introducing said gas reactant from its associated said chamber centrally into each of said tubes beyond the introducing opening for said liquid reactant, means for introducing an inert gas from a further single chamber of uniform pressure into each of said tubes through an annular space comprised between said gaseous reactant introducing nozzles and the inner surface of said reaction tubes, the inlet openings for the inert gas being sized, in relation to the inert gas flow rate, to impart pressure drops to said inert gas flows at the entrance of said reaction tubes which are only small fractions of the pressure drop in the metering and introducing nozzles of said gaseous reactant, so



that said inert gas distributes to said tubes to equalize the pressure in said tubes.

4,183,898

LIQUID BASE MAKEUP COMPOSITION

Lawrence J. Liff, 6502 N. Central #A-101, Phoenix, Ariz. 85012

Filed May 25, 1978, Ser. No. 909,576
Int. Cl.[2] A61K *7/021*
U.S. Cl. 424—63 **4 Claims**

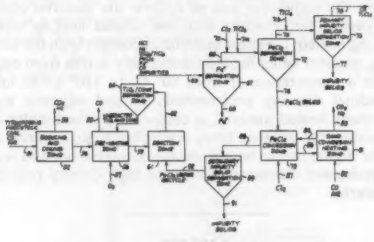
1. A liquid base formulation for multiple makeup uses consisting of 96.48% water; 2.0% cellulose; 0.15% of ethylparaben and propylparaben; 1.34% chlorine dioxide; and 0.03% phosphoric acid.

4,183,899

CHLORINATION OF ILMENITE AND THE LIKE

James P. Bonsack, Aberdeen, Md., assignor to SCM Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 817,719, Jul. 21, 1977, abandoned, and Ser. No. 817,587, Jul. 21, 1977, abandoned. This application Mar. 10, 1978, Ser. No. 885,442
Int. Cl.[2] C01G *23/02*
U.S. Cl. 423—79 **42 Claims**



1. A flow process for chlorinating ferruginous titaniferous material having an iron to titanium molar ratio (Fe/Ti) of x:1, x being a positive number having a value of at least about 0.25, for producing titanium chlorides and by-product metallic iron, which comprises

passing through a reaction zone maintained at about 1050°–1950° C. in substantially laminar flow a mixture of said titaniferous material in finely-divided form; carbonaceous reductant; and a chlorinating agent selected from

the group consisting of chlorine gas, HCL, an organochloride, and mixtures thereof; there being not more than (x+2) moles of chlorine provided from said chlorinating agent per gram atom of titanium in said titaniferous material,

the atomic ratio of carbon in said mixture to the oxygen content in said mixture being greater than 1:1 for formation of CO,

withdrawing from said zone a product stream containing said titanium chlorides comprising $TiCl_4$, said by-product metallic iron, carbon monoxide, and iron chlorides comprising $FeCl_2$,

the molar ratio of chlorine from said chlorinating agent to said titanium in said titaniferous solids (Cl_2/Ti), said iron to titanium ratio (Fe/Ti) in said titaniferous solids, and said reaction zone temperature being those whereby neither all of said chlorine nor all of said iron in said titaniferous solids is converted into iron chlorides withdrawn from said zone; and

separating at least said titanium chlorides and said by-product metallic iron from said product stream.

20. A flow process for essentially completely chlorinating the titanium content of ferruginous titaniferous material whereby essentially all the iron content is converted to metallic form which comprises:

passing through a reaction zone maintained at about 1350° to 1950° C. in substantially laminar flow a mixture of said titaniferous material in finely-divided solid form and having a molar ratio of iron to titanium (Fe/Ti) of not above 2; carbonaceous reductant; a chlorinating agent selected from the group consisting of chlorine gas, HCl, an organochloride, and mixtures thereof; and iron chlorides recycled from a later step of the process, the molar ratio of said iron chlorides recycled to said titanium ($FeCl_2$/Ti) being not substantially above about 1 and the molar ratio of the chlorine in said chlorinating agent to said iron chlorides recycled ($Cl_2/FeCl_2$) being not substantially less than about 2:1,

the atomic ratio of carbon in said mixture to the oxygen content in said mixture being greater than 1:1 for formation of CO, there being no more than about 2 moles of chlorine from said chlorinating agent per gram-atom of titanium in said titaniferous solids, and said Fe/Ti ratio in said titaniferous material and said reaction zone temperature being those whereby the net chlorination of said titanium and reduction of said iron is in a steady-state;

withdrawing from said zone a product stream containing titanium chlorides comprising $TiCl_4$, by-product metallic iron, carbon monoxide, and iron chlorides comprising ferrous chloride,

separating from said withdrawn product stream said iron chlorides, said titanium chlorides, and said by-product metallic iron; and

recycling said separated iron chlorides to said reaction zone.

4,183,900
RECOVERY OF Mg++ FROM BRINES

John M. Lee, and William C. Bauman, both of Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 812,542, Jul. 5, 1977, Pat. No. 4,116,857. This application Sep. 5, 1978, Ser. No. 939,544
Int. Cl.² B01D *15/04*
U.S. Cl. 423—157 **5 Claims**

4. A process for recovering Mg^{++} values from brine, said process comprising

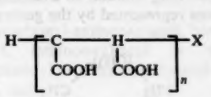
1. providing a particulate anion exchange resin having suspended therein a microcrystalline $MgX_2.2Al(OH)_3$ structure, where X is a halide, which has had a portion of the MgX_2 removed by elution,
2. contacting a Mg^{++}-containing brine with said resin, thereby enriching said resin with Mg^{++} values from said brine, and
3. separating said resin, now enriched with Mg^{++} values, from said brine.

4,183,901
PROCESS FOR CRYSTALLIZATION OF ANHYDROUS SODIUM CARBONATE

Joseph M. Ilardi, North Brunswick, and Eric Rau, Lawrenceville, both of N.J., assignors to FMC Corporation, Philadelphia, Pa.

Continuation-in-part of Ser. No. 798,709, May 19, 1977, abandoned, which is a continuation-in-part of Ser. No. 651,943, Jan. 23, 1976, abandoned. This application Jul. 24, 1978, Ser. No. 927,187
Int. Cl.² C01D *7/00, 7/40*
U.S. Cl. 423—206 T **11 Claims**

1. A process for preparing crystalline anhydrous sodium carbonate from saturated sodium carbonate aqueous solutions, the solutions containing not more than about 0.4% by weight of sulfate ions, comprising adding to said solutions from about 25 to 5,000 parts per million by weight of an additive selected from the group consisting of maleic acid-alkanol telomers having the formula:

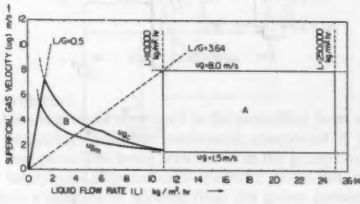


wherein n is an integer of about 1 to 8 and X represents RCHOH, R being either hydrogen or an alkyl group of 1 to 5 carbon atoms; sodium tripolyphosphate; benzoic acid; phenol; and mixtures of same; and evaporating water from said solutions at temperatures of from about 104° to below 109° C. whereby anhydrous crystalline sodium carbonate is formed.

4,183,902
WET PROCESS FOR REMOVING SPECIFIC COMPONENT FROM GAS

Noboru Hashimoto, Yokohama; Teizo Senjo, Machida, and Makio Kobayashi, Toyonaka, all of Japan, assignors to JGC Corporation; Fuji Kasui Engineering Co., Ltd., both of Tokyo and Sumitomo Metal Industries, Ltd., Osaka, all of, Japan

Filed Jun. 13, 1978, Ser. No. 915,080
Int. Cl.² B01D *53/34*
U.S. Cl. 423—210 **11 Claims**



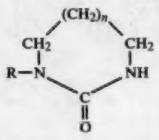
1. In a process for removing a specific component from a gas containing the same which comprises passing said gas upwardly through a scrubbing column provided with at least one perforated or grid plate without weir and downcomer and having a free-space ratio (Fc) in the range of from 0.30 to 0.60, and simultaneously passing a scrubbing liquid downwardly through the column, the improvement wherein (a) a superficial gas velocity of said gas is within the range of from 1.5 to 8 m/sec and (b) a liquid flow rate (L) of said scrubbing liquid is more than 115,000 kg/m²-hr and not more than 250,000 kg/m²-hr.

4,183,903
METHOD OF REMOVING CARBON DIOXIDE FROM GASES UTILIZING AN ALKALINE ABSORPTION SOLUTION CONTAINING A CYCLIC UREA ANTI-FOAMING AGENT

Michael T. Melchior, Scotch Plains; George E. Milliman, Fanwood, and Guido Sartori, Linden, all of N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Aug. 2, 1978, Ser. No. 930,222
Int. Cl.[2] B01D *53/34*
U.S. Cl. 423—226 **11 Claims**

1. A process for the removal of CO_2 from a gaseous stream containing CO_2 which comprises contacting said gaseous stream (1) in an absorption step with an aqueous absorbing solution comprising an alkaline material selected from the group consisting of alkali metal salts, alkali metal hydroxides and amines and (2) in a desorption and regeneration step desorbing at least a portion of the absorbed CO_2 from said absorbing solution, the improvement which comprises including in said aqueous absorbing solution an antifoaming agent comprising a cyclic urea represented by the general formula:

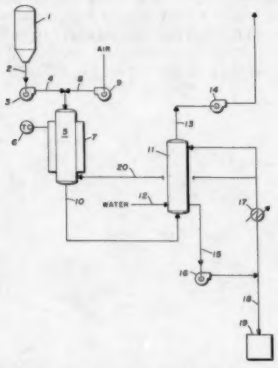


wherein R is a secondary or tertiary alkyl or cycloalkyl or substituted cycloalkyl radical having from 4–20 carbon atoms and n is 0–2.

4,183,904
RECOVERY OF BORON FROM WASTE STREAMS

Oscar A. Meyer, Pensacola, Fla., assignor to Monsanto Company, St. Louis, Mo.

Filed Oct. 3, 1977, Ser. No. 839,068
Int. Cl.[2] C01B *35/06*
U.S. Cl. 423—283 **7 Claims**

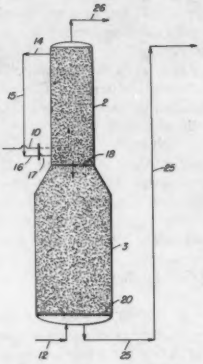


1. A method for the recovery of boron from waste streams comprising boric acid and combustible organic materials, the method comprising incinerating the combustible organic materials in the presence of boric acid at a temperature of 600°–1600° C. at about atmospheric pressure to thereby simultaneously burn the combustible organic materials to produce products of combustion in vapor phase and dehydrate the boric acid to boric oxide; concomitantly hydrating to equilibrium the boric oxide in the presence of water to metaboric acid in vapor phase and polyboric acid in liquid phase; cooling the products of combustion and the metaboric and polyboric acids in the presence of water to a temperature of 50°–70° C. by quenching the solid and liquid mixture of boric acids with a plurality of fine liquid streams comprising water, whereby, after cooling, the major portion of the boric acid is solidified and hydrated simultaneously, thereby to produce a mixture of boric acids in solid and liquid phase leaving the products of combustion in vapor phase; and thereafter dissolving the solid phase in the water and physically separating the liquid phase from the vapor phase thereby recovering boron in the form of boric acid.

4,183,905
PRODUCING PHOSPHORUS OXYHALIDE

B. Meredith Winn, Jr., Richmond, Va., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Aug. 16, 1978, Ser. No. 934,233
Int. Cl.[2] C01B *25/10*
U.S. Cl. 423—300 **6 Claims**



1. An improved process of converting phosphorus trihalide to phosphorus oxyhalide by reacting phosphorus trihalide with oxygen, which reaction is subject to explosion when the vapor above the liquid reaction contains at least about 50% of phosphorus trihalide, the improvement comprising, in a reactor containing an upper and a lower reaction zone, feeding phosphorus trihalide into the bottom portion of said upper zone and causing said phosphorus trihalide to rise to the top thereof while oxygen enters the bottom of said lower zone, the phosphorus trihalide reacting in the upper zone with the rising oxygen to form a PX_3-POX_3 mixture, causing said mixture to exit through an exit means in the top portion of the upper zone and than to be discharged near the top of the lower reaction zone wherein said mixture reacts further with the upflowing oxygen as said mixture flows downward toward a product exit.

4,183,906
OXYGEN-ENRICHMENT COLUMNAR ABSORPTION PROCESS FOR MAKING NITRIC ACID

Richard W. Watson, Derby, and Philip G. Blakey, Derbyshire, both of England, assignors to BOC Limited, London, England

Filed Jun. 15, 1978, Ser. No. 915,861
Claims priority, application United Kingdom, Jun. 16, 1977, 25269/77
Int. Cl.[2] C01B *21/40*
U.S. Cl. 423—392 **12 Claims**

1. In a gas-liquid contact process for making nitric acid including the steps of:

(a) reacting primary air and ammonia catalytically at elevated temperature to form a gas comprising nitric oxide, nitrogen, oxygen and water vapour;

(b) cooling the gas to a temperature at which water vapour condenses;

(c) introducing the cooled gas into one or more columnar absorption zones and contacting it countercurrently with water and thereby forming product nitric acid;
(d) passing the product nitric acid into a bleaching zone wherein bleaching air is passed through the product nitric acid;
(e) passing secondary air through the or each absorption zone with the cooled gas, the secondary air being constituted at least in part by the bleaching air;
the improvement comprising performing the following steps:
(1) enriching the bleaching air in oxygen, in, upstream of, or downstream of, the bleaching zone;
(2) enriching in oxygen the gas passing through the absorption zone(s) at one or more regions where the absorption reaction is from 50 to 90% complete.

4,183,907
METHOD FOR PREPARING CALCIUM HYPOCHLORITE

Richard W. Lynch, Chattanooga, and Ronald L. Dotson, Cleveland, both of Tenn., assignors to Olin Corporation, New Haven, Conn.

Filed Aug. 28, 1978, Ser. No. 937,224
Int. Cl.[2] C01B *11/06*
U.S. Cl. 423—474 **29 Claims**

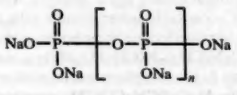
1. A process for producing calcium hypochlorite which comprises:
(a) reacting organic hypochlorite with calcium hydroxide in a first reaction zone to form calcium hypochlorite, wherein said calcium hydroxide has a free water content of less than about 1% by weight and wherein said first reaction zone has a free water content of less than about 1% by weight,
(b) separating calcium hypochlorite and unreacted calcium hydroxide from the first reaction zone as a mixture of solids,
(c) reacting organic hypochlorite with sodium hydroxide in a second reaction zone to form an aqueous phase containing sodium hypochlorite and an organic phase,
(d) separating said aqueous phase from said organic phase,
(e) reacting chlorine with said mixture of solids and said aqueous phase in a third reaction zone to produce an aqueous slurry of calcium hypochlorite particles, and
(f) recovering said calcium hypochlorite particles from said slurry.

4,183,908
CRYSTALLINE CALCIUM SULFATE DIHYDRATE AND PROCESS FOR MAKING SAME

Richard B. Rolfe, Glendale, Calif., assignor to Southern California Edison Company, Rosmead, Calif.

Filed Jun. 24, 1977, Ser. No. 809,661
Int. Cl.[2] C01F *11/46*
U.S. Cl. 423—555 **23 Claims**

1. The process for the continuous precipitation of crystalline calcium sulfate dihydrate product comprising the step of continuously precipitating calcium sulfate dihydrate crystals from an aqueous mixture by reacting in said mixture a source of calcium ions and a source of sulfate ions in the presence of from about 0.5 to about 10,000 parts per million by weight of the mixture of an additive comprising a combination of molecularly dehydrated phosphates having the empirical formula:



wherein n is from 3 to 14, the polymers having n equal to 12 to 14 comprise at least about 75% of the total polymeric species and the polymers having n equal to 3–4 comprise at least about 15% of the total polymeric species.

4,183,909
PHENYLGLYCINE-CONTAINING NEW PEPTIDES WITH GASTRINE EFFECTS AND A PROCESS FOR THE PREPARATION THEREOF

Istvan Schon; Lajos Kisfaludy, both of Budapest; Vince Varro, Szeged; Laszlo Varga, Szeged, and Jozsef Nafradi, Budapest, all of Hungary, assignors to Richter Gedeon Vegyeszeti Gyar Rt., Budapest, Hungary

Filed Dec. 12, 1977, Ser. No. 859,931
Claims priority, application Hungary, Dec. 24, 1976, RI 607
Int. Cl.[2] A61K *29/00, 37/00;* C07C *103/52*
U.S. Cl. 424—9 **16 Claims**

1. A peptide of formula (I),

A-Trp-B-Asp-Phg-NH_2 (I)

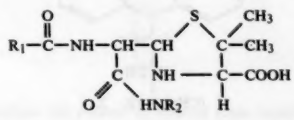
wherein
A is tert.-butoxycarbonyl-aminooxy-acyl, benzyloxycarbonyl-aminooxy-acyl, (aminooxy)-acyl or E-aminooxy-acyl, wherein E is benzoyl or a straight-chained or branched C_{1-5} aliphatic acyl, and
B is methionyl, leucyl, norleucyl, norvalyl or 2-amino-decanoyl,
or an acid addition salt or complex thereof.

4,183,910
METHOD FOR TESTING TO PREDICT AND/OR DIAGNOSE ALLERGY TO PENICILLINS, AND COMPOUNDS AND COMPOSITIONS FOR USE IN SUCH TESTS

Bernard B. Levine, 210 Riverside Dr., New York, N.Y. 10025

Filed Apr. 20, 1978, Ser. No. 898,044
Int. Cl.[2] C07D *277/06, 417/12;* A61K *37/02, 31/425*
U.S. Cl. 424—9 **5 Claims**

1. A method for skin testing for allergy or hypersensitivity to penicillins, including benzyl penicillin and semi-synthetic penicillins, by the detection of minor determinant-specific skin sensitizing antibodies, such as, IgE antibodies or other skin sensitizing antibodies comprising prick, scratch or intradermal testing of the skin of a patient with solutions consisting essentially of
(1) a compound represented by the formula:



wherein:
R_1 is a side chain contained in the penicillins from which the penicilloyl amine or aminoacid compound is prepared; said penicillins being selected from the group consisting of benzylpenicillin and semi-synthetic penicillins, and
R_2 is a substituent selected from the group consisting of an alkyl group of C_2–C_6 chain length, a carboxy alkyl group of C_2–C_6 chain length, or a residue of an aminoacid or amine compound of the type present in the blood, blood plasma or tissue fluids, said compound being selected from the group consisting of cystamine, spermine, spermidine, phosphoethanolamine, arginine, cystine, glutamine, histidine, lysine, proline, serine, threonine, and asparagine,
said compounds being α-diastereoisomers, other diastereoisomers or diastereoisomeric mixtures; and
(2) a suitable solvent for said compound (1),
said solvent being compatible with the use of said composition in skin testing for penicillin allergy or hypersensitivity

to penicillins, including benzyl penicillin and semisynthetic penicillins,

the concentration of said compound (1) in said solvent (2) being sufficient to elicit a wheal and flare response in patients allergic or potentially allergic to said penicillins when said composition is administered to said patient in said skin testing but said concentration being optimal to avoid a constitutional reaction.

4,183,911

ANTIPERSPIRANT COMPOSITIONS

Barry Smithies, Rochdale, and Alan Straw, Macclesfield, both of England, assignors to Colgate-Palmolive Company, New York, N.Y.

Filed May 24, 1974, Ser. No. 472,975

Claims priority, application United Kingdom, Sep. 18, 1973, 43699/73

Int. Cl.[2] A61K *9/32, 9/36, 9/38, 9/40;* **B01J** *13/00*

U.S. Cl. 424—36 **13 Claims**

1. A non-staining antiperspirant spray powder composition in a valved container, comprising 1 to 7% of an unencapsulated, powdered aluminum, zinc, or zirconium antiperspirant salt having a particle size of 2 to 200 microns, 0.1 to 3% of an encapsulated surface active material selected from the group consisting of anionic, nonionic, cationic and amphoteric surfactants and a propellant fluid under pressure.

4,183,912

INHALATION THERAPY FOR RELIEVING BRONCHIAL SPASM USING QUATERNARY SALTS OF PROMETHAZINE

Marvin E. Rosenthale, Princeton, N.J., assignor to American Home Products Corporation, New York, N.Y.

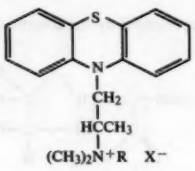
Filed Jan. 16, 1978, Ser. No. 869,408

Int. Cl.[2] A61K *31/54*

U.S. Cl. 424—45 **5 Claims**

1. A method of relieving bronchial spasm and facilitating breathing in warm-blooded animals which comprises administering to a warm-blooded animal in need thereof, by aerosol route, an amount sufficient to relieve bronchial spasm and facilitate breathing in said warm-blooded animal of a composition comprising:

(a) a compound of the formula:



wherein R is hydroxyalkyl of from 1 to 4 carbon atoms with the proviso that the hydroxyl group is not borne on the same carbon atom which is bonded to nitrogen; X is a pharmacologically acceptable anion; and

(b) a pharmacologically acceptable carrier.

4,183,913

ECTOPARASITICIDAL COMPOSITIONS AND USE

Edgar Enders, Cologne; Wilhelm Stendel, Wuppertal, and Herbert Voege, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Fed. Rep. of Germany

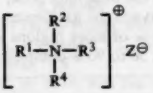
Division of Ser. No. 741,214, Nov. 12, 1976, Pat. No. 4,112,065. This application Jan. 12, 1978, Ser. No. 868,858

Claims priority, application Fed. Rep. of Germany, Nov. 27, 1975, 2553259

Int. Cl.[2] A61L *9/04;* **A01N** *9/00, 9/20, 9/22*

U.S. Cl. 424—45 **19 Claims**

1. A composition for combatting ectoparasitic ticks of domesticated animals comprising a tickicidally effective amount of a mixture of (a) a bis-(2-X-phenyl)carbodiimide in which X is alkyl of 1 to 6 carbon atoms or cycloalkyl of 3 to 6 carbon atoms which carbodiimide is further unsubstituted or further substituted on each phenyl group with from one to three like or different substituents selected from the group consisting of halo, alkyl of 1 to 6 carbon atoms or cycloalkyl of 3 to 6 carbon atoms and (b) from 0.05 to 3 parts, by weight of said carbodiimide, of a quaternary ammonium salt having a total of from 10 to 50 carbon atoms in its cation, said salt being of the formula:



wherein R^1, R^2 and R^3 together with the nitrogen atom to which they are bound are pyridinyl or imidazolyl and R^4 is alkyl, cycloalkyl, aralkyl or aryl; and $Z^{\ominus}$ is a monovalent anionic radical.

4,183,914

MAGNESIUM POLYCARBOXYLATE COMPLEXES AND ANTICALCULUS AGENTS

Abdul Gaffar, and Maria C. S. Gaffar, both of 30 Macafee Rd., Somerset, N.J.

Filed Dec. 19, 1977, Ser. No. 861,795

Int. Cl.[2] A61K *9/68, 7/16*

U.S. Cl. 424—48 **8 Claims**

1. An oral composition comprising a dental cream, mouthrinse, troche or lozenge, chewing gum, dental tablet or powder or mouthspray containing as the essential anticalculus agent, a magnesium polycarboxylate complex of a magnesium compound and a polycarboxylate compound in the ratio of 1:40 to about 4:1 magnesium compound to polycarboxylate and having a pH of about 4.5–7.8, wherein said polycarboxylate contains ionizable carboxyl groups and is a copolymer of maleic acid or anhydride and of an olefin having 2 or more carbon atoms per molecule, and is ionically bound to a dissociable, physiologically acceptable magnesium compound, wherein said magnesium compound constitutes about 0.01–5% by weight and the polycarboxylate constitutes about 0.1–10% by weight of the composition.

4,183,915

STABLE SOLUTION FOR DENTAL REMINERALIZATION

Maria C. S. Gaffar, and Abdul Gaffar, both of Somerset, N.J., assignors to Colgate-Palmolive Company, New York, N.Y.

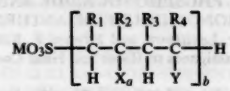
Filed Oct. 13, 1978, Ser. No. 951,893

Int. Cl.[2] A61K *7/16, 7/18, 7/22*

U.S. Cl. 424—52 **17 Claims**

1. A stable aqueous remineralizing solution comprising water having dissolved therein a source of calcium ions and a source of phosphate ions, the amount of calcium ions and phosphate ions being sufficient to effect remineralization of dental enamel; a compound which provides fluoride anticaries agent; and an antinucleating agent selected from the group of acids and orally acceptable water-soluble salts thereof consisting of: diamine tetramethylenephosphonic acids of the formula $(M_2O_3PH_2C)_2N(CH_2)_nN(CH_2PO_3M_2)_2$, wherein n is an integer from 1–10; phosphonoacetic acid or salt thereof of the formula $M_2O_3PCH_2COOM$; peroxydiphosphate of the formula $M_4P_2O_8$;

an oligomer



in which M is hydrogen
or an orally acceptable cation: R_1, R_2, R_3, and R_4 are independently hydrogen, methyl or ethyl; Y is at least one hydrophilic member of the group consisting of —COOM, —$CONH_2$ and CH_2OH; X is at least one hydrophobic member of the group consisting of —CN, —COOR, —$COOR_5OR$, —CONHR and —$COONHR_4COR$;
R is C_{1-8} alkyl; R_5 is C_{1-4} alkylene; a is 0–7 and a+b is about 4–15; said solution having a pH of about 5 to 9.

4,183,916
ORAL COMPOSITIONS

Maria Rodon, Raleigh, N.C., assignor to Beecham Inc., Clifton, N.J.

Filed Mar. 31, 1978, Ser. No. 892,276
Int. Cl.² A61K *7/22, 7/24*
U.S. Cl. 424—54 **20 Claims**

1. An oral composition useful for controlling dental plaque and gingivitis and for preventing caries which comprises from 0.1% to about 1.0% w/w or w/v of a cationic antimicrobial agent otherwise tending to stain teeth, and useful for controlling dental plaque and gingivitis and for preventing caries selected from the group consisting of a bisbiguanide or quaternary ammonium compound and from 0.1% to 10.0% w/w or w/v of malic acid effective to inhibit said teeth staining, in combination with a pharmaceutically acceptable carrier.

4,183,917
EMULSION-TYPE HAIR CONDITIONER COMPOSITION

Shuji Iwao, Tokyo; Tetsuya Abe, Yokohama; Tsutomu Yoshida, Narashino, and Akemi Wada, Tokyo, all of Japan, assignors to The Lion Dentifrice Co., Ltd., Tokyo, Japan

Filed Nov. 4, 1977, Ser. No. 848,691
Claims priority, application Japan, Dec. 25, 1976, 51-157202; Jun. 2, 1977, 52-65150
Int. Cl.² A61K *7/06*
U.S. Cl. 424—70 **6 Claims**

1. A hair conditioner composition in the form of an oil-in-water type emulsion comprising 1 to 50% by weight of a high molecular synthetic oil with molecular weight over 1500 selected from the group consisting of polyalkylene glycol monoalkyl ethers, phosphates thereof and alkylene oxide polyol adducts 0.05 to 5% by weight of a cationic surface active agent, 0.5 to 10% by weight of a nonionic surface active agent and balance of water.

4,183,918
DETOXIFYING-MEDICINAL EMULSIONS

William J. Asher, Fanwood; Norman N. Li, Edison, and Adam L. Shrier, Montclair, all of N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Continuation of Ser. No. 775,575, Mar. 8, 1977, abandoned, which is a continuation-in-part of Ser. No. 466,293, May 2, 1974, abandoned. This application Feb. 13, 1978, Ser. No. 877,340
Int. Cl.² A61K *37/48, 47/00, 33/08*
U.S. Cl. 424—94 **69 Claims**

1. A method for removing a toxin from the gastrointestinal tract which comprises providing an emulsion in said gastrointestinal tract, said emulsion comprising an interior phase surrounded by an exterior phase, said exterior phase being immiscible with the aqueous environment of said gastrointestinal tract and permeable to said toxin, said exterior phase comprising an oil-soluble surfactant component and an oil component, said oil-soluble surfactant component and said oil component are harmless to the human body, said oil-soluble surfactant component being present in said exterior phase from about 0.01 wt. % up to the solubility limit of said surfactant in said exterior phase but not more than 90 wt. % of said exterior phase, said oil component having a viscosity between about 2 and about 1,000 centistokes at normal body temperature and is selected from the group consisting of vegetable oils and animal fats that are heavily hydrogenated to contain at least 10% more hydrogen then normal saturation, per fluorinated hydrocarbons, silicone fluids containing the repeating unit

and hydrocarbon oils refined to remove toxic ingredients and comprising molecular weights up to 1,000, selected from the group consisting of paraffins, isoparaffins, naphthenes, and aromatics and said interior phase being immiscible with said exterior phase and comprises a reactant capable of converting said toxin into a nonpermeable form, said emulsion being further characterized as being stable in said gastrointestinal tract, whereby said toxin permeates the exterior phase of said emulsion into said interior phase and is converted into a nonpermeable form.

46. An emulsion useful in removing a toxin from the gastrointestinal tract and which is characterized as being stable in said gastrointestinal tract, which comprises an interior phase surrounded by an exterior phase, said exterior phase is immiscible with the aqueous environment of said gastrointestinal tract and permeable to said toxin, said exterior phase comprises an oil-soluble surfactant component and an oil component, said oil-soluble surfactant component and said oil component are harmless to the human body, said oil-soluble surfactant component is present in said exterior phase from about 0.01 wt. % up to the solubility limit of said surfactant in said exterior phase but not more than 90 wt. % of said exterior phase, said oil component has a viscosity between about 2 and about 1,000 centistokes at normal body temperature and is selected from the group consisting of vegetable oils and animal fats that are heavily hydrogenated to contain at least 10% more hydrogen than normal saturation, perfluorinated hydrocarbons, silicone fluids containing the repeating unit

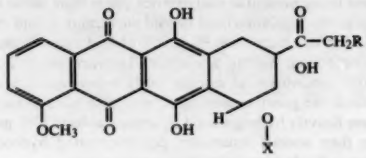
and hydrocarbon oils refined to remove toxic ingredients and comprises molecular weights up to 1,000, selected from the group consisting of paraffins, isoparaffins, naphthenes, and aromatics and said interior comprises a reactant capable of converting said toxin into a nonpermeable form.

4,183,919
ANTITUMOR GLYCOSIDES, PROCESS FOR THEIR PREPARATION INCLUDING INTERMEDIATES THEREFOR AND THEIR USE

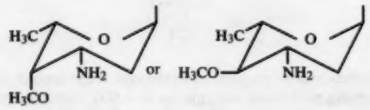
Giuseppe Cassinelli, Voghera; Federico Arcamone, Nerviano, and Aurelio Di Marco, Milan, all of Italy, assignors to Farmitalia Carlo Erba S.p.A., Milan, Italy

Filed Dec. 14, 1977, Ser. No. 860,447
Claims priority, application United Kingdom, Dec. 22, 1976, 53454/76
Int. Cl.² A61K *31/70*
U.S. Cl. 424—180 **8 Claims**

1. A compound of the formula:


(IA)

wherein R is hydrogen or hydroxy; and X is



and the hydrochlorides thereof.

7. A method of inhibiting the growth of P_{388} leukemia and L_{1210} leukemia in a host afflicted therewith, said method comprising intraperitoneally administering to said host a compound according to claim 1 in an amount sufficient to inhibit the growth thereof.

8. A pharmaceutical composition for inhibiting the growth of P_{388} leukemia comprising a compound of claim 1 in an amount sufficient to inhibit the growth thereof.

4,183,920

4-N-ACYL, 2'-N-ACYL AND 4,2'-N,N'-DIACYLFORTIMICIN E DERIVATIVES

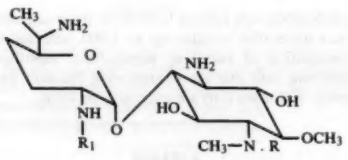
Paul Kurath; John S. Tadanier, and Jerry R. Martin, all of Waukegan, Ill., assignors to Abbott Laboratories, North Chicago, Ill.

Filed Dec. 21, 1977, Ser. No. 863,010

Int. Cl.[2] A61K *31/71;* **C07H** *15/22*

U.S. Cl. 424—180 **18 Claims**

1. A Fortimicin E derivative of the formula



wherein R is hydrogen, acyl, aminoacyl, N-loweralkylaminoacyl, N,N-diloweralkylaminoacyl, hydroxy-substituted aminoacyl or an amino acid residue; and R_1 is hydrogen, acyl, amino acyl, N-loweralkylaminoacyl, N,N-diloweralkylaminoacyl hydroxy-substituted aminoacyl or an amino acid residue with the limitation that R cannot be hydrogen when R_1 is hydrogen and R_1 cannot be hydrogen when R is hydrogen; and the pharmaceutically acceptable salts thereof.

18. A pharmaceutical composition comprising a therapeutically effective amount of a compound of claim 1, or a pharmaceutically acceptable carrier or diluent.

4,183,921

PHOSPHONOUREIDE AND PHOSPHONOTHIOUREIDE ANTHELMINTICS

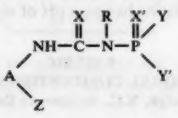
W. David Weir, Levittown, and Edward E. Kilbourn, Chalfont, both of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Division of Ser. No. 625,998, Oct. 28, 1975, Pat. No. 4,076,809, which is a continuation-in-part of Ser. No. 354,629, Apr. 25, 1973, abandoned, which is a continuation-in-part of Ser. No. 263,378, Jun. 5, 1972, abandoned. This application Oct. 17, 1977, Ser. No. 842,645

Int. Cl.[2] A61K *31/675;* **C07D** *239/04*

U.S. Cl. 424—200 **27 Claims**

1. A compound of the formula:



wherein

A is a divalent arylene group optionally substituted with

a. halogen;

b. cyano;

c. nitro;

d. di(C_1–C_{18}) alkylamino;

e. vicinal alkylene of from 2 to 6 carbon atoms; or

f. a group of the formula:

$$R^1(A')_\alpha$$

wherein

R^1 is

1. an alkyl group of from 1 to 4 carbon atoms;

2. a substituted or unsubstituted aromatic group containing from 6 to 10 carbon atoms in the aromatic ring;

A' is oxygen, sulfur, sulfinyl, sulfonyl or carbonyl; and α is an integer of 0 to 1;

R is

a. hydrogen;

b. (C_1–C_{10}) alkyl;

c. (C_1–C_{10}) haloalkyl;

d. (C_3–C_6) cycloalkyl;

e. (C_2–C_{11}) alkoxyalkyl;

f. (C_1–C_{10}) cyanoalkyl;

g. (C_3–C_6) alkenyl;

h. (C_3–C_6) haloalkenyl;

i. (C_3–C_6) alkynyl;

j. (C_3–C_6) haloalkynyl;

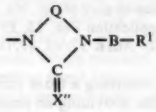
k. optionally substituted aralkyl of up to 11 carbon atoms;

l. substituted or unsubstituted (C_6–C_{10}) aryl;

Y is R', OR', N(R')$_2$ or SR' and

Y' is OR', N(R')$_2$ or SR' wherein R' is alkyl (C_1–C_4), substituted alkyl (C_1–C_4), aralkyl (C_7–C_{10}), alkenyl (C_1–C_4), substituted alkenyl (C_1–C_4), phenyl, substituted phenyl, naphthyl, or substituted naphthyl

X is oxygen or sulfur; X' is oxygen or sulfur; and Z is a group of the formula:



wherein R^1 is as defined above; B is carbonyl, sulfinyl, or sulfonyl; Q is alkylene of from 2 to 4 carbon atoms; and X'' is oxygen or sulfur, provided that when X'' is sulfur, X is oxygen; or a pharmaceutically acceptable salt of said compound.

14. A method for combatting a helminth infection in a host

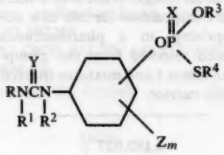
animal which comprises administering an anthelmintically effective amount of a compound of claim 1 to said animal.

4,183,922
O,S-DIALYL O,S-UREIDOPHENYL PHOSPHOROTHIOLATES AND PHOSPHORODITHIOATES

Ronald Taylor, Coraopolis, Pa., assignor to Rohm and Haas Company, Philadelphia, Pa.

Filed Dec. 6, 1977, Ser. No. 857,952
Int. Cl.[2] A01N *9/36;* **C07F** *9/165*
U.S. Cl. 424—211 **23 Claims**

1. A compound of the formula:



wherein

R is

(a) an unsubstituted (C_6–C_{10})aryl group or a (C_6–C_{10})aryl group independently substituted with up to 3 substituents selected from the group consisting of nitro groups, halogen atoms, (C_1–C_4)alkyl groups, (C_1–C_4)alkoxy groups, (C_1–C_4)alkylthio groups, cyano groups and trifluoromethyl groups,

(b) an unsubstituted (C_6–C_{10})aryl carbonyl group or a (C_6–C_{10})aryl carbonyl group substituted with up to 3 substituents selected from the group consisting of nitro groups, halogen atoms, (C_1–C_4)alkyl groups, (C_1–C_4)alkoxy groups, (C_1–C_4)alkylthio groups, cyano groups and trifluoromethyl groups;

R^1 and R^2 are independently a hydrogen atom or a (C_1–C_4)alkyl group;

R^3 is a (C_1–C_4)alkyl group;

R^4 is a (C_3–C_6)alkyl group;

Z is a (C_1–C_4)alkyl group, a (C_1–C_4)alkoxy group, a halogen atom, or a trifluoromethyl group;

X and Y are independently an oxygen or sulfur atom; and

m is zero or an integer from 1 to 3.

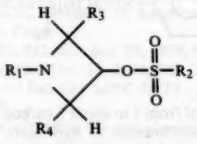
2. A method of controlling pests which comprises applying directly to the pests or to the loci to be freed of or protected from attack by such pests, a pesticidally effective amount of a compound of claim 1.

4,183,923
ANTIPSORIATIC COMPOSITIONS

Elijah H. Gold, West Orange, and Daniel M. Solomon, Edison, both of N.J., assignors to Schering Corporation, Kenilworth, N.J.

Filed Nov. 7, 1977, Ser. No. 849,362
Int. Cl.[2] A61K *31/58*
U.S. Cl. 424—241 **18 Claims**

11. A topical pharmaceutical composition for the treatment of psoriasis comprising 0.05 to 5% by weight of a compound of the formula



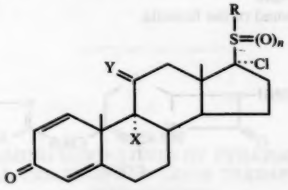
wherein R_1 is selected from the group consisting of hydrogen, alkyl groups containing 3–18 carbon atoms, cycloalkyl groups containing 5–15 carbon atoms, 1-adamantyl, 2-adamantyl, benzhydryl, benzyl, dihydroxybenzyl, dialkoxybenzyl, dibenzyloxybenzyl, and 3-(5α-cholestane) and 3-(5α-androstan-17-one) groups; R_2 is selected from the group consisting of alkyl groups containing 1–18 carbon atoms, benzyl and tolyl; and R_3 and R_4 are independently hydrogen or alkyl of 1–4 carbon atoms, and the pharmaceutically acceptable acid addition salts thereof in a vehicle suitable for topical administration.

4,183,924
17α-CHLORO-17β-HYDROCARBONSULFINYL-1,4-ANDROSTADIENES AND THE CORRESPONDING 17β-HYDROCARBONSULFONYL DERIVATIVES AND THEIR USE AS ANTI-ACNE AGENTS

Michael J. Green, Kendall Park, and Robert Tiberi, Englishtown, both of N.J., assignors to Schering Corporation, Kenilworth, N.J.

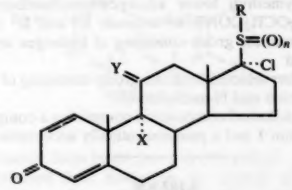
Filed Feb. 27, 1978, Ser. No. 881,217
Int. Cl.[2] A61K *31/565;* **C07J** *31/00*
U.S. Cl. 424—242 **18 Claims**

1. A steroid having the formula:



wherein R is benzyl, phenethyl, methylbenzyl, dimethylbenzyl, chlorobenzyl, dichlorobenzyl and an alkyl group having up to 8 carbon atoms; X is hydrogen or fluorine; Y is oxygen, or hydrogen when X is hydrogen, and n is 1 or 2.

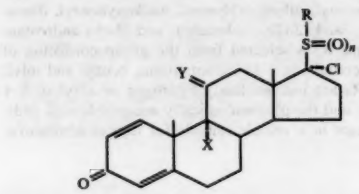
17. The method of treating and controlling acne which comprises applying either topically or intralesionally to the affected area, or by oral administration in a concentration effective for the treatment of acne, a steroid having the formula:



wherein R is benzyl, phenethyl, methylbenzyl, dimethylbenzyl, chlorobenzyl, dichlorobenzyl and an alkyl group having up to 8 carbon atoms; X is hydrogen or fluorine, Y is oxygen or hydrogen when X is hydrogen, and n is 1 or 2;

together with a non-toxic, pharmaceutically acceptable carrier.

18. A pharmaceutical composition for the treatment of acne comprising an anti-acne effective amount of a steroid having the formula:



wherein R is benzyl, phenethyl, methylbenzyl, dimethylbenzyl, chlorobenzyl, dichlorobenzyl and an alkyl group having up to 8 carbon atoms; X is hydrogen or fluorine, Y is oxygen or hydrogen when X is hydrogen, and n is 1 or 2;

together with a non-toxic, pharmaceutically acceptable carrier.

4,183,925

7-AMINOPHENYLACETAMIDO-Δ^3-CEPHEM ANTIBACTERIAL AGENTS AND METHOD OF USE

Charles A. R. Baxter, Margate, and Braham Shroot, Canterbury, both of England, assignors to Pfizer Inc., New York, N.Y.

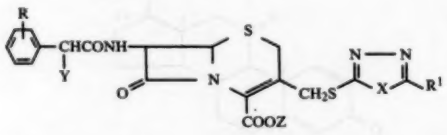
Division of Ser. No. 670,880, Mar. 26, 1976, Pat. No. 4,080,451. This application Oct. 21, 1977, Ser. No. 844,268

Claims priority, application United Kingdom, Mar. 27, 1975, 12813/75; Oct. 2, 1975, 40447/75; Oct. 24, 1975, 43935/75

Int. Cl.[2] C07D *501/36*

U.S. Cl. 424—246 **8 Claims**

1. A compound of the formula:



and the pharmaceutically acceptable salts thereof, wherein

R is a member selected from the group consisting of hydrogen and hydroxyl;

Y is a member selected from the group consisting of amino and OR^4 where R^4 is chosen from the group consisting of lower alkanoyl, lower alkoxycarbonyl and benzoyl;

Z is a member selected from the group consisting of hydrogen, lower alkyl, benzhydryl, phenyl, indan-5-yl, lower alkylcarbonyloxymethyl, lower α-(alkoxycarbonyloxy)ethyl and 3-phthalido;

R^1 is a member selected from the group consisting of carboxymethoxymethyl, lower alkoxycarbonylmethoxymethyl and $CH_2OCH_2CONR^2R^3$ wherein R^2 and R^3 are each chosen from the group consisting of hydrogen and lower alkyl; and

X is a member selected from the group consisting of oxygen, sulfur, imino and N-methylimino.

7. A pharmaceutical composition comprising a compound as claimed in claim 1 and a pharmaceutically acceptable carrier.

4,183,926

PHENOTHIAZINE DERIVATIVES, THEIR PREPARATION AND THERAPEUTIC USE

André Esanu, Paris, France, assignor to Societe D'Etudes De Produits Chimiques, Paris, France

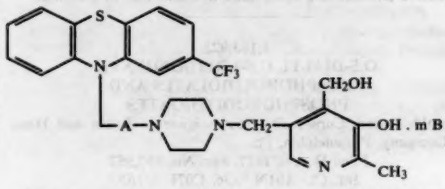
Filed Nov. 17, 1977, Ser. No. 852,575

Claims priority, application United Kingdom, Dec. 1, 1976, 50014/76

Int. Cl.[2] C07D *417/14;* A61K *31/44*

U.S. Cl. 424—247 **2 Claims**

1. A phenothiazine derivative of the formula:



wherein m is an integer from 1 to 3 included, B a therapeutically acceptable acid and A stands for an alkylene chain C_nH_{2n} in which n is an integer from 1 to 5 included.

2. A therapeutic composition for use as a neuroleptic, said composition comprising, in a pharmaceutically effective amount, a compound selected from the group consisting of those compounds of claim 1 and mixtures thereof, in a pharmaceutically acceptable carrier.

4,183,927

SUBSTITUTED PHENYLTHIOALKYLAMINES AND COMPOSITIONS THEREOF

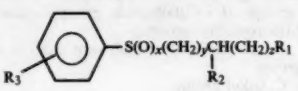
Louis E. Begin, Midland, Mich.; Robert J. Broersma, Jr., Noblesville; George D. Dickerson, Indianapolis, both of Ind., and Joseph E. Dunbar, Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 714,949, Aug. 16, 1976, abandoned. This application Sep. 13, 1977, Ser. No. 832,848

Int. Cl.[2] C07D *295/10;* A61K *31/535*

U.S. Cl. 424—248.5 **23 Claims**

1. A compound of the formula



wherein:

R_1 is morpholino;

R_2 is lower alkyl of from 1 to about 2 carbon atoms, morpholino, 4-morpholinylmethyl, or hydrogen;

R_3 is hydroxy, or acetoxy;

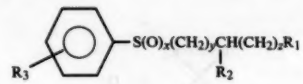
x is an integer of from 0 to 2;

y is an integer of from 0 from 2 with the proviso that when R_2 is lower alkyl or morpholino y is 1 and when R_2 is 4-morpholinylmethyl y is 0;

z is an integer of from 0 to 3 with the proviso that when R_2 is hydrogen z is 0;

and further including the pharmaceutically-acceptable salts thereof.

13. A composition for inhibiting the aggregation of blood platelets in a mammal comprising a pharmaceutical carrier having incorporated therein an effective blood platelet aggregation inhibiting amount of a compound corresponding to the formula



wherein:

R_1 is morpholino;

R_2 is lower alkyl of from 1 to about 2 carbon atoms, morpholino, 4-morpholinylmethyl, or hydrogen;

R_3 is hydroxy, or acetoxy;

x is an integer of from 0 to 2;

y is an integer of from 0 to 2 with the proviso that when R_2

is lower alkyl or morpholino y is 1 and when R_2 is 4-morpholinylmethyl y is 0;

z is an integer of from 0 to 3 with the proviso that when R_2 is hydrogen z is 0;

and further including the pharmaceutically-acceptable salts thereof.

4,183,928

HALOARYLMALONAMIDOOXACEPHALOSPORINS

Yoshio Hamashima, Kyoto; Masayuki Narisada, Ibaraki; Sadao Hayashi, Ashiya, and Wataru Nagata, Nishinomiya, all of Japan, assignors to Shionogi and Coo, LTD. Osaka, Japan.

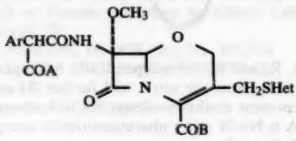
Filed Apr. 26, 1978, Ser. No. 900,235

Claims priority, application Japan, Apr. 28, 1977, 52-49630; Aug. 25, 1977, 52-102260

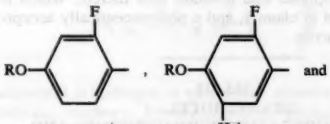
Int. Cl.[2] C07D *413/02;* A61K *31/395, 31/535*

U.S. Cl. 424—248.52 **8 Claims**

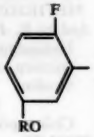
1. A compound of the formula



wherein Ar is a member of the group consisting of



and



wherein RO is hydroxy or conventionally protected hydroxy, Hal is fluoro or chloro; COA and COB each represents a member of the group consisting of carboxy, conventionally protected carboxy and a pharmaceutically acceptable carboxylic acid carboxy salt group and Het represents 1-methyltetrazol-5-yl.

6. An antibacterial composition which comprises an antibacterially effective amount of a compound according to claim 1 in admixture with a pharmaceutically acceptable carrier.

4,183,929

TRI-SUBSTITUTED TRIAZINES

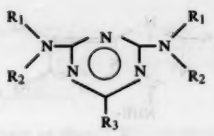
Ransom B. Conrow, Pearl River, and Seymour Bernstein, New City, both of N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 811,101, Jun. 29, 1977, Pat. No. 4,132,850. This application Oct. 13, 1978, Ser. No. 951,413

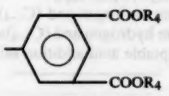
Int. Cl.[2] A61K *31/53*

U.S. Cl. 424—249 **12 Claims**

1. A method of inhibiting the complement system in a body fluid which comprises subjecting said body fluid to the action of an effective complement inhibiting amount of a compound of the formula:



wherein R_1 is selected from the group consisting of hydrogen and carboxymethyl; R_2 is selected from the group consisting of carboxymethyl and



wherein R_4 is alkali metal; R_3 is selected from the group consisting of chlorine and

wherein R_1 and R_2 are as previously defined; and the pharmaceutically acceptable salts thereof.

4,183,930

AMINO DERIVATIVES OF PYRAZOLO [1,5-a]s-TRIAZINE, AND THEIR THERAPEUTIC APPLICATIONS

Claude Cohen, Versailles, France, assignor to Aron S.A., Suresnes, France

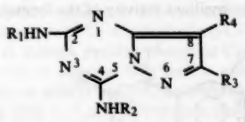
Filed Dec. 19, 1978, Ser. No. 970,980

Claims priority, application United Kingdom, Jan. 9, 1978, 756/78

Int. Cl.[2] C07D *487/04;* A61K *31/53*

U.S. Cl. 424—249 **5 Claims**

1. A compound selected from the group consisting of the compounds having the general formula:



(I)

in which:

R_1 is selected from hydrogen and (C_{1-4})alkyl,

R_2 is selected from hydrogen, (C_{1-4})alkyl, (C_{2-4})alkenyl, (C_{1-4}) alkoxy-(C_{1-4})alkyl tetrahydrofuryl- (C_{1-4})alkyl and tetrahydropyranyl-(C_{1-4})alkyl,

R_3 is selected from hydrogen and (C_{1-4})alkyl, and

R_4 is selected from hydrogen and (C_{1-4})alkyl, and a pharmaceutically acceptable acid addition salt thereof.

4. A therapeutic composition having a bronchodilator action and anti-allergic properties containing a bronchodilator and anti-allergic effective amount of a compound selected from the group consisting of the compounds having the general formula:

(I)

in which:

R_1 is selected from hydrogen and (C_{1-4})alkyl,

R_2 is selected from hydrogen, (C_{1-4})alkyl, (C_{2-4})alkenyl, (C_{1-4})alkoxy-(C_{1-4})alkyl tetrahydrofuryl- (C_{1-4})alkyl and tetrahydropyranyl-(C_{1-4})alkyl,

R_3 is selected from hydrogen and (C_{1-4})alkyl, and

R_4 is selected from hydrogen and (C_{1-4})alkyl, and a pharmaceutically acceptable acid addition salt thereof.

4,183,931

2-KETOALKYL-4(3H)-QUINAZOLINONES

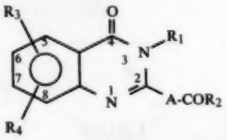
James F. Wolfe, Blacksburg, Va., and Terry L. Rathman, Hershey, Pa., assignors to Research Corporation, New York, N.Y.

Filed Sep. 8, 1977, Ser. No. 831,446

Int. Cl.[2] A61K *31/505;* **C07D** *239/90, 239/91*

U.S. Cl. 424—251 **17 Claims**

4. A pharmaceutical composition comprising a pharmaceutically acceptable carrier in combination with a safe and CNS depressant amount of a 2-ketoalkyl-4(3H)-quinazolinone having sedative-hypnotic and/or anticonvulsant activity of the formula:



wherein

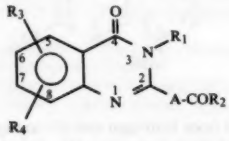
A is divalent alkylene of 1–10 carbon atoms;

R_1 is alkyl of 1–3 carbon atoms, alkylphenyl of 1–3 carbon atoms in the alkyl substituent, halophenyl or dihalophenyl;

R_2 is alkyl of 1–3 carbon atoms, alkenyl of 2–5 carbon atoms or pyridyl; and

at least one of R_3 and R_4 is hydrogen and the other is hydrogen, hydroxy, amino, halogen, trifluoromethyl, alkyl, alkoxy, alkylthio or alkylsulfonyl each of 1–4 carbon atoms.

8. A 2-ketoalkyl-4(3H)-quinazolinone having sedative-hypnotic and/or anticonvulsant activity of the formula



wherein

A is divalent alkylene of 1–3 carbon atoms;

R_1 is alkylphenyl of 1–3 carbon atoms in the alkyl substituent, halophenyl or dihalophenyl;

R_2 is alkyl of 1–3 carbon atoms, alkenyl of 2–5 carbon atoms or pyridyl; and

at least one of R_3 and R_4 is hydrogen and the other is hydrogen, hydroxy, amino, halogen, trifluoromethyl, alkyl, alkoxy, alkylthio or alkylsulfonyl each of 1–4 carbon atoms.

4,183,932

FUSED QUINAZOLINONES AND PREPARATION THEREOF

Michihiro Yamamoto; Masao Koshiba, both of Nishinomiya, and Hisao Yamamoto, Kobe, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Jan. 31, 1978, Ser. No. 873,785

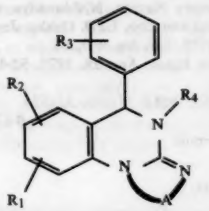
Claims priority, application Japan, Feb. 9, 1977, 52-13818

Int. Cl.[2] A61K *31/41;* **C07D** *487/04, 487/14*

U.S. Cl. 424—251 **3 Claims**

1. A compound of the formula,

(I)



wherein R_1, R_2 and R_3 are independently hydrogen, halogen, C_{1-4} alkyl, C_{1-4} alkoxy or nitro, and further R_1 and R_2 may together represent methylenedioxy; R_4 is hydrogen or C_{1-4} alkyl; and A is N=N and a pharmaceutically acceptable acid addition salt thereof.

3. A pharmaceutical composition containing as an active ingredient one or more compounds of the formula (I) or pharmaceutically acceptable acid addition salts thereof, which is given and defined in claim **1**, and a pharmaceutically acceptable diluent or carrier.

4,183,933

DIARYLBUTYL OCTAHYDROPYRAZINOPYRIMIDINONES AND METHODS OF MEDICAL TREATMENT USING THEM

Anders K. K. Bjork, Bjarred; Aina L. Abramo; Sven E. H. Hernestam, both of Malmo, and Bengt E. S. Kjellberg, Staffanstorp, all of Sweden, assignors to AB Ferrosan, Malmo, Sweden

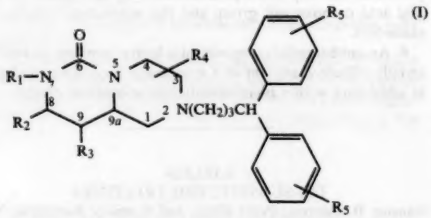
Filed Aug. 30, 1978, Ser. No. 938,041

Claims priority, application United Kingdom, Sep. 5, 1977, 36904/77

Int. Cl.[2] C07D *487/04;* **A61K** *31/505*

U.S. Cl. 424—251 **8 Claims**

1. A compound of the general formula I



(I)

wherein R_1 is a member selected from the group consisting of hydrogen, straight and branch chained alkyl containing from 1 to 10 carbon atoms, cycloalkyl containing from 3 to 8 carbon atoms, aralkyl containing from 7 to 9 carbon atoms, phenyl unsubstituted or substituted by one to three substituents selected from halogen, including F, Cl and Br, lower alkyl containing from 1 to 5 carbon atoms, lower alkoxy containing from 1 to 5 carbon atoms, alkylenedioxy having from 1 to 3 carbon atoms, —CF_3 and —CN groups, R_2 and R_3 are mem-

bers independently selected from hydrogen, lower alkyl containing from 1 to 3 carbon atoms and phenyl unsubstituted or substituted by halogen including F, Cl and Br, lower alkyl containing from 1 to 3 carbon atoms, lower alkoxy containing from 1 to 3 carbon atoms, lower thioalkyl containing from 1 to 3 carbon atoms and $-CF_3$ groups, R_4 is a member selected from the group consisting of hydrogen, lower alkyl containing from 1 to 5 carbon atoms and phenyl, and R_5 is a member selected from the group consisting of hydrogen, halogen including F, Cl and Br, methoxy and $-CF_3$ groups, and acid addition salts thereof.

8. A pharmaceutical composition for treatment of mental illness, neurosis, behavioral disturbances, inflammation, anorexia or cardiac and vascular disorders, containing a pharmaceutically effective amount of a compound of Formula I as defined in claim 1, in a conventional pharmaceutical carrier.

4,183,934

4-HYDROXY-7-(SUBSTITUTED)PHENYLPTERIDINES

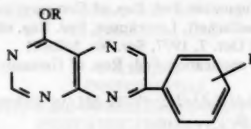
Gerard Y. Paris, Duvernay; Denis G. Cimon, Montreal-Nord; Dilbagh S. Bariana, Pointe-Claire, and Anthony Fung, Pierrefonds, all of Canada, assignors to Abbott Laboratories, North Chicago, Ill.

Filed Oct. 16, 1978, Ser. No. 951,936

Int. Cl.[2] A61K *31/505;* **C07D** *475/02*

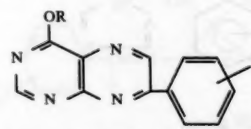
U.S. Cl. 424—251 **16 Claims**

1. A compound of the formula



wherein R is hydrogen or methyl and wherein R′ is hydrogen, chlorine, carboxy, loweralkylamino, diloweralkylamino or loweralkyl, or a pharmaceutically acceptable acid addition salt thereof.

7. A medicinal composition for increasing the excretion of sodium and chlorine ions from warm-blooded animals containing a compound of the formula:



wherein R is hydrogen or methyl and R′ is hydrogen, chlorine, carboxy, loweralkylamino, diloweralkylamino or loweralkyl, or a pharmaceutically acceptable acid addition salt thereof.

4,183,935

BISPIDINE DERIVATIVES, THEIR PREPARATION, AND DRUGS CONTAINING SAME

Fritz Binnig, Fussgoenheim; Ludwig Friedrich, Mannheim; Hans P. Hofmann, Ludwigshafen; Horst Kreiskott, Wachenheim; Claus Mueller, Viernheim, and Manfred Raschack, Weisenheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

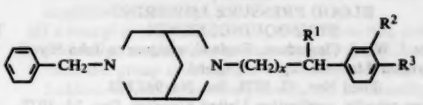
Filed Jun. 13, 1978, Ser. No. 915,119

Claims priority, application Fed. Rep. of Germany, Jun. 13, 1977, 2726571

Int. Cl.[2] A61K *31/445;* **C07D** *471/08*

U.S. Cl. 424—256 **15 Claims**

7. A therapeutic composition comprising an effective amount of at least one compound according to general formula I



where R^1 is hydrogen or phenyl, R^2 is hydrogen, chlorine or trifluoromethyl, R^3 is hydrogen, fluorine or chlorine and x is 0 or 1, and its salts with a physiologically acceptable acid, with the proviso that R^1, R^2 and R^3 cannot all be H where x is 0 in association with a therapeutically acceptable carrier.

4,183,936

PYRIDOPYRROLOBENZHETEROCYCLES

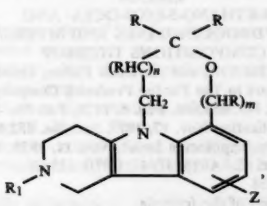
Parthasarathi Rajagopalan, Westbury, N.Y., assignor to Endo Laboratories, Inc., Garden City, N.Y.

Division of Ser. No. 755,121, Dec. 28, 1976, Pat. No. 4,115,577, which is a division of Ser. No. 586,746, Jul. 13, 1975, Pat. No. 4,013,652, which is a division of Ser. No. 357,528, May 7, 1973, Pat. No. 3,914,421, which is a continuation-in-part of Ser. No. 263,766, Jun. 9, 1972, abandoned. This application Jun. 16, 1978, Ser. No. 916,846

Int. Cl.[2] A61K *31/445;* **C07D** *413/02*

U.S. Cl. 424—256 **5 Claims**

1. Compound of the formula:



wherein

m and n are 0 or 1 and the sum of m+n is at least 1;

the R groups are the same or different and are H or CH_3, and one of them can be C_2–C_9 alkyl, phenyl, C_7–C_{10} phenylalkyl, furyl, thienyl, pyridyl, phenyl or C_7–C_{10} phenylalkyl substituted on adjacent ring carbon atoms with methylenedioxy, or phenyl or C_7–C_{10} phenylalkyl substituted on the ring with 1, 2 or 3 substituents individually selected from methoxy, ethoxy, bromine, chlorine, fluorine, trifluoromethyl and C_1–C_4 alkyl;

R^1 is hydrogen, C_1–C_4 alkyl, C_3–C_5 alkenyl, C_3–C_5 alkynyl, C_3–C_6 cycloalkyl, C_2–C_4 alkoxycarbonyl, trifluoroacetyl or substituted C_1–C_4 alkyl where the substituent is C_3–C_6 cycloalkyl, phenyl, phenyl substituted on adjacent carbon atoms with methylene-dioxy, or phenyl substituted with 1, 2 or 3 substituents individually selected from methoxy, ethoxy, bromine, chlorine, fluorine, and trifluoromethyl; and

Z is H, Cl or CH_3; and their pharmaceutically suitable salts.

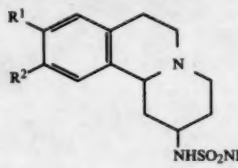
5. A method for inducing sedation in a warm-blooded animal which comprises administering to the animal an effective sedative amount of a compound of claim 1.

4,183,937
BLOOD PRESSURE LOWERING BENZOQUINOLIZINES

Terence J. Ward, Cippenham, England, assignor to John Wyeth & Brother Limited, Taplow, England

Filed Nov. 22, 1978, Ser. No. 962,823
Claims priority, application United Kingdom, Dec. 14, 1977, 52009/77
Int. Cl.[2] A61K 31/47; C07D 455/06
U.S. Cl. 424—258 9 Claims

9. A pharmaceutical composition having blood pressure lowering activity comprising an blood pressure lowering amount of a compound selected from the group consisting of a benzoquinolizine of the formula (I)



(I)

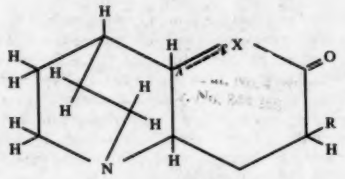
and a pharmaceutically acceptable acid addition salt thereof, wherein R^1 and R^2 which may be the same or different, each represent hydrogen, lower alkyl, lower alkoxy or halogen, R^3 and R^4 which may be the same or different each represent hydrogen, lower alkyl, phenyl, phenyl loweralkyl, substituted phenyl or substituted phenyl loweralkyl, wherein the phenyl substituents are selected from one or more of halogen, lower alkoxy, lower alkyl, lower alkylenedioxy, amino, lower alkylamino, diloweralkyl amino or trifluoromethyl or R^3 and R^4 together represent a a tetra- or pentamethylene chain, in association with a pharmaceutically acceptable carrier.

4,183,938
1,8-ETHANO-5-OXO-OCTA- AND -DECAHYDROQUINOLINES AND MYDRIATIC COMPOSITIONS THEREOF

Sasson Cohen, Tel-Aviv, and Abraham Fisher, Holon, both of Israel, assignors to The Purdue Frederick Company, N.Y.

Division of Ser. No. 655,650, Feb. 6, 1976, Pat. No. 4,083,985.
This application Nov. 17, 1977, Ser. No. 852,402
Claims priority, application Israel, Nov. 11, 1975, 48453
Int. Cl.[2] A61K 31/47; C07D 215/20
U.S. Cl. 424—258 5 Claims

1. A compound of the formula:



wherein X is selected from the group consisting of CH_2 and CH, wherein when X is CH_2 then A-B is a single bond and wherein when X is CH then A-B is a double bond and wherein R is selected from the group consisting of lower alkyl, cyclopentyl, cyclohexyl, thienyl, phenyl, methylphenyl, methoxyphenyl, chlorophenyl, trifluoromethylphenyl, aminophenyl, di-loweralkylamino phenyl and benzyl, and physiologically acceptable salts thereof.

5. A pharmaceutical preparation for use as a mydriatic, comprising a mydriatic effective amount of the compound of claim 1 dissolved in a solvent therefor which is pharmaceutically acceptable therefor.

4,183,939
GLAUCINE ANALGESIC METHOD

Thomas H. Gieske, and Philip J. Shea, both of Indianapolis, Ind., assignors to The Dow Chemical Company, Midland, Mich.

Filed Sep. 1, 1978, Ser. No. 939,144
Int. Cl.[2] A61K 31/47, 31/485
U.S. Cl. 424—258 9 Claims

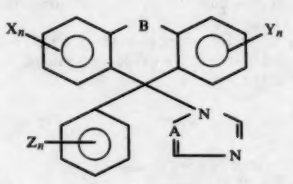
1. A method of alleviating pain in animals, comprising administering to an animal an analgesic amount of a pharmaceutically-acceptable salt of a glaucine compound selected from the group consisting of l-glaucine, d,l-glaucine and a mixture thereof.

4,183,940
ANTIMYCOTIC IMIDAZOLYL-9,10-DIHYDRO-ANTHRACENE DERIVATIVES

Karl H. Büchel; Wolfgang Krämer; Manfred Plempel, and Ingo Haller, all of Wuppertal, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Oct. 7, 1977, Ser. No. 840,461
Claims priority, application Fed. Rep. of Germany, Oct. 30, 1976, 2650171
Int. Cl.[2] A61K 31/415; C07D 233/56, 233/60
U.S. Cl. 424—273 R 11 Claims

1. An azolyl-9,10-dihydroanthracene derivative of the formula I

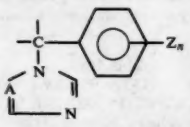


(I)

in which

A represents a CH group,

B represents a CO group or a group of the formula:



X, Y and Z are identical or different and each represents halogen, alkyl with 1 to 4 carbon atoms, halogenoalkyl with up to 4 carbon atoms and up to 5 halogen atoms, alkoxy with 1 to 4 carbon atoms or alkylthio with 1 to 4 carbon atoms and n represents 0 or an integer of from 1 to 4, or a pharmaceutically acceptable salt thereof.

9. A method of combating mycoses in warm-blooded animals in need of such treatment, which comprises administering to the animals an effective amount of a compound of claim 1 either alone or in admixture with a diluent or in the form of a medicament.

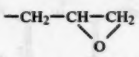
4,183,941
TREATMENT OF RHEUMATOID ARTHRITIS AND RELATED DISEASES

Roger Wyburn-Mason, Richmond, England, assignor to John R. A. Simoons, Summit, N.J.

Filed Aug. 21, 1978, Ser. No. 935,401
Int. Cl.[2] A61K *31/415*
U.S. Cl. 424—273 R **6 Claims**

1. A method for producing remission in patients suffering from active rheumatoid arthritis which comprises administering to such a patient an effective amount to produce such remission of a compound of the formula:

wherein R′ is hydrogen, lower alkyl or a halogen, R is



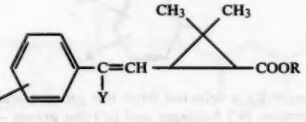
or $-(CH_2)_n-CH(OH)-(CH_2)_n-X$ wherein n is a whole integer from 1 to 4 and may be the same or different, X is a halogen, and one of R_4 and R_5 is NO_2, and the pharmaceutically cceptable acid addition salts thereof.

4,183,942
INSECTICIDAL (β-PHENYL-β-SUBSTITUTED-VINYL)CYCLOPROPANECARBOXYLATES

John F. Engel, Medina, N.Y., assignor to FMC Corporation, Philadelphia, Pa.

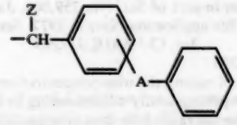
Continuation-in-part of Ser. No. 718,252, Aug. 27, 1976, abandoned. This application Oct. 23, 1978, Ser. No. 954,036
Int. Cl.[2] A01N *9/24*; C07C *121/60, 69/76*
U.S. Cl. 424—274 **10 Claims**

1. An insecticidal compound of the formula:



in which X is halogen, cyano, nitro, aryl, aralkyl, aryloxy, arylthio, alkyl of C_1–C_4, alkoxy of C_1–C_4, alkylthio of C_1–C_4, haloalkyl of C_1–C_2, dialkylamino in which alkyls are C_1–C_2, or methylenedioxy; Y is halogen or haloalkyl of C_1–C_2; n is 0, 1, 2, or 3; and R is an alcohol residue selected from the group consisting of:

(a) a benzyl- or phenoxy-substituted benzyl group of the formula:



wherein Z is hydrogen, methyl, cyano, ethynyl, or phenyl and A is —O— or —CH_2—;

(b) 5-benzyl-3-furylmethyl;

(c) an imidomethyl group selected from the group consisting of maleimidomethyl, phthalimidomethyl, and tetrahydrophthalimidomethyl; and

(d) a benzyl group substituted in at least two ring positions with chloro, methyl, or methylenedioxy groups, selected from the group consisting of 3,4-methylenedioxybenzyl, 2-chloro-4,5-methylenedioxybenzyl, and 2,4-dimethylbenzyl.

8. An insecticidal composition comprising an insecticidally effective amount of a compound of claim **1** in admixture with an agriculturally acceptable extender.

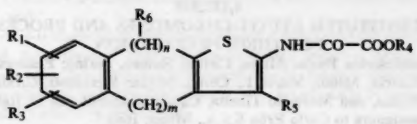
9. An insecticidal composition of claim **8** which contains a surface active agent.

4,183,943
ORGANIC COMPOUNDS

Jean-Michel Bastian, Therwil, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

Filed Feb. 3, 1978, Ser. No. 875,114
Claims priority, application Switzerland, Feb. 8, 1977, 1489/77; Mar. 18, 1977, 3423/77; Mar. 18, 1977, 3424/77
Int. Cl.[2] A01N *9/00*; C07D *333/24*
U.S. Cl. 424—275 **32 Claims**

1. A compound of formula,



wherein

n is from 0 to 4,

m is from 0 to 4,

whereby n+m is at least 1 and not greater than 4,

R_1 is hydrogen, halogen of atomic number from 9 to 35, alkyl of 1 to 4 carbon atoms or alkoxy of 1 to 4 carbon atoms,

R_2 is hydrogen, alkyl of 1 to 4 carbon atoms or alkoxy of 1 to 4 carbon atoms,

R_3 is hydrogen, alkyl of 1 to 4 carbon atoms or alkoxy of 1 to 4 carbon atoms,

whereby not more than one of the substituents R_1, R_2 and R_3 can be branched alkyl or alkoxy,

R_4 is hydrogen or alkyl of 1 to 4 carbon atoms,

R_5 is nitrile, carbamoyl or carboxyl when R_4 is hydrogen, and

R_5 is nitrile carbamoyl or $COOR_7$, wherein R_7 is alkyl of 1 to 4 carbon atoms, when R_4 is alkyl of 1 to 4 carbon atoms, and

R_6 is hydrogen or, when n is 2 and m is 0, one of R_6 can be alkyl of 1 to 4 carbon atoms,

in free form or in the form of a pharmaceutically acceptable salt.

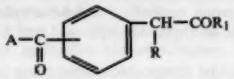
4,183,944
THIENOTHIENYLCARBONYL-PHENYLALKANOIC ACIDS AND DERIVATIVES THEREOF

Jean-Louis Fabre, Paris; Daniel Farge, Thiais, and Claude James, Paris, all of France, assignors to Rhone Poulenc Industries, Paris, France

Division of Ser. No. 763,141, Jan. 27, 1977, Pat. No. 4,124,596. This application Jun. 13, 1978, Ser. No. 915,241
Claims priority, application France, Jan. 29, 1976, 76 02378; Jul. 20, 1976, 76 22066; Dec. 16, 1976, 76 37858
Int. Cl.[2] A01K *31/38*
U.S. Cl. 424—275 **13 Claims**

1. A pharmaceutical composition having activity as an analgesic, antipyretic, anti-inflammatory or inhibitor of platelet aggregation, which comprises, as active ingredient, an an amount effective as an analgesic, antipyretic, an anti-inflamma-

tory agent, or to inhibit platelet aggregation of a thienothienylcarbonyl-phenylalkanoic acid compound of the formula:



wherein R represents hydrogen or an alkyl radical, R_1 represents a hydroxy, amino or alkoxy radical, or an alkylamino or dialkylamino group; the various alkyl radicals and the alkoxy radical being optionally substituted by a dialkylamino group, it being understood that in the definitions of R and R_1 above the alkyl radicals and the alkoxy radical contain from 1 to 4 carbon atoms, and the symbol A represents the thieno[2,3-b]thien-2-yl or thieno[3,2-b]thien-2-yl radical, the A—CO— grouping being attached to the 3- or 4-position of the phenyl ring, and when R_1 represents the hydroxy radical its pharmaceutically acceptable metal salts, ammonium salt and addition salts with nitrogen-containing bases, and when R_1 represents a group containing basic nitrogen its pharmaceutically acceptable acid addition salts, in association with a pharmaceutical carrier.

4,183,945

SUBSTITUTED 2-VINYL-CHROMONES AND PROCESS FOR THEIR PREPARATION

Gianfederico Doria, Milan; Ciriaco Romeo, Serino; Francesco Lauria, Milan; Maria L. Corno, Milan; Piernicola Giraldi, Milan, and Marcello Tibolla, Canale d'Agordo, all of Italy, assignors to Carlo Erba S.p.A., Milan, Italy

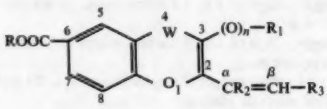
Division of Ser. No. 803,947, Jun. 6, 1977, Pat. No. 4,152,449. This application Jul. 24, 1978, Ser. No. 927,010

Claims priority, application Italy, Jun. 16, 1976, 24356 A/76; Jan. 12, 1977, 19193 A/77

Int. Cl.[2] C07D *311/22*

U.S. Cl. 424—283 **8 Claims**

1. A compound of formula

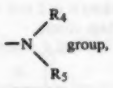


(I)

wherein

n is zero;

R is hydrogen or C_1–C_{12} alkyl, unsubstituted or substituted by a C_2–C_5 alkanoyloxy or by a

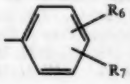


wherein each of R_4 and R_5 is independently selected from the group consisting of hydrogen and C_1–C_{10} alkyl;

R_1 is C_2–C_4 alkyl or C_3–C_4 alkenyl;

R_2 is hydrogen or methyl;

R_3 is the group



wherein each of R_6 and R_7 is independently selected from the group consisting of (a') hydrogen; (b') halogen; and (c') the group $—(O)_{n1}—R_8$, wherein n_1 is zero and R_8 is C_3–C_4 alkenyl or C_1–C_4 alkyl, being the akenyl and the alkyl groups unsubstituted or substituted by one or more C_1–C_2 alkoxy or hydroxy groups;

W is >C=O or >C=S, and a pharmaceutically acceptable salt thereof.

4,183,946

SUBSTITUTED 2-VINYL-CHROMONES AND PROCESS FOR THEIR PREPARATION

Gianfederico Doria, Milan; Ciriaco Romeo, Serino; Francesco Lauria, Milan; Maria L. Corno, Milan; Piernicola Giraldi, Milan, and Marcello Tibolla, Canale d'Agordo, all of Italy, assignors to Carlo Erba S.p.A., Milan, Italy

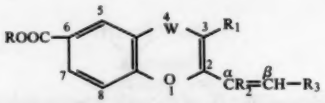
Division of Ser. No. 803,947, Jun. 6, 1977. This application Jul. 24, 1978, Ser. No. 927,593

Claims priority, application Italy, Jun. 16, 1976, 24356 A/76; Jan. 12, 1977, 19193 A/77

Int. Cl.[2] C07D *311/22*

U.S. Cl. 424—283 **8 Claims**

1. A compound of the formula



wherein

W is >C=O or >C=S.

R is hydrogen or C_1–C_{12} alkyl, unsubstituted or substituted by a C_2–C_5 alkanoyloxy or by a

wherein each of R_4 and R_5 is independently selected from the group consisting of hydrogen and C_1–C_{10} alkyl;

R_1 is C_2–C_4 alkyl or C_3–C_4 alkenyl;

R_2 is hydrogen or methyl;

R_3 is the group

wherein R_6 is selected from the group consisting of (a') hydrogen; (b') halogen; and (c') the group $—(O)_{n1}—R_8$, wherein n_1 is zero or 1 and R_8 is C_3–C_4 alkenyl or C_1–C_4 alkyl, wherein the alkenyl and the alkyl groups are unsubstituted or substituted by one or more C_1–C_2 alkoxy or hydroxy groups, and R_7 is the group —O—R_8, wherein R_8 is defined above.

4,183,947

NUTRITIONAL AND THERAPEUTIC IRON COMPOSITION AND METHOD OF MAKING

Vernon L. Cockerill, 1000 Macomb Rd., Rushville, Ill. 62681

Continuation-in-part of Ser. No. 759,004, Jan. 13, 1977, abandoned. This application Nov. 2, 1977, Ser. No. 847,741

Int. Cl.[2] A61K *31/295*

U.S. Cl. 424—295 **12 Claims**

1. A method of raising the iron concentration of the blood of a mammal, comprising orally administering to a mammal in an amount effective for raising the iron concentration of the blood an orally administrable composition having as the essential source of iron a reaction product comprised essentially of one molar equivalent of an ingestible salt of ferrous iron and glycine in an amount in excess of two molar equivalents of glycine and up to about 8 molar equivalents of glycine for each mole of

ferrous iron, said ferrous iron in said reaction product being in a non-ionic form with two moles of glycine ionically bonded to each mole of ferrous iron, said glycine in excess of two moles being covalently bonded to said ferrous iron, and said composition being stable in the pH range of the mammal's gastrointestinal tract.

7. An orally administrable iron composition having as the essential source of iron a reaction product comprised essentially of an ingestible salt of ferrous iron and glycine in an amount in excess of two molar equivalents of glycine and up to about 8 molar equivalents of glycine for each mole of ferrous iron which is effective for raising the iron concentration in the blood of a mammal when administered orally, said ferrous iron in said reaction product being in a non-ionic form with two moles of glycine ionically bonded to each mole of ferrous iron, said glycine in excess of two moles being covalently bonded to said ferrous iron, and said composition being stable in the pH range of the mammals gastrointestinal tract.

4,183,948

HALOGENATED ESTERS

Roger K. Huff, Wokingham, England, assignor to Imperial Chemical Industries Limited, London, England

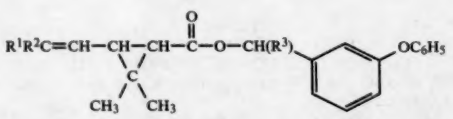
Filed Jan. 16, 1978, Ser. No. 869,615

Claims priority, application United Kingdom, Mar. 23, 1977, 12210/77; Sep. 2, 1977, 36714/77; Sep. 2, 1977, 36715/77

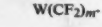
Int. Cl.[2] C07C *69/74, 121/66;* **A01N** *9/20, 9/24*

U.S. Cl. 424—304 **26 Claims**

1. A compound of formula:



wherein one of R^1 and R^2 represents a group of formula:



where W represents an atom of hydrogen, fluorine or chlorine and m has the value one or two, and the other of R^1 and R^2 represents an atom or fluorine, chlorine or bromine or a group of formula:

where each of X, Y and Z independently represents an atom of hydrogen, fluorine or chlorine, and R^3 represents an atom of hydrogen, or the cyano or ethynyl group.

23. A method of combating insect or acarine pests at a locus which comprises treating the locus with an insecticidally or acaricidally effective amount of a compound according to claim 1.

4,183,949

PESTICIDALLY ACTIVE 1-ARYLAMINO-2,4-DINITRONAPHTHALENES

Rainer Hamprecht, Cologne; Alfons Hartmann, Beckingen; Erich Klauke, Odenthal-Hahnenberg; Ingeborg Hammann, Cologne; Peter Roessler, Bergisch-Gladbach, and Wilhelm Brandes, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Feb. 1, 1978, Ser. No. 876,456

Claims priority, application Fed. Rep. of Germany, Feb. 26, 1977, 2708440

Int. Cl.[2] A01N *9/20;* **C07C** *87/66, 121/78*

U.S. Cl. 424—304 **10 Claims**

1. A 1-arylamino-2,4-dinitronaphthalene selected from the group consisting of

1(2-cyano-4-nitro-phenylamino)-2,4-dinitronaphthalene,

1-(2-cyano-4,6-dinitro-phenylamino)-2,4-dinitronaphthalene,

1-(2-methylsulfonyl-4-nitro-phenylamino)-2,4-dinitronaphthalene,

1-(2-nitro-4-trifluoromethyl-phenylamino)-2,4-dinitronaphthalene,

1-(3,5-bis-trifluoromethyl-phenylamino)-2,4-dinitronaphthalene,

1-(2-nitro-4,6-dichlorophenylamino)-2,4-dinitronaphthalene, and

1-(2,4-trifluoromethylphenylamino)-2,4-dinitronaphthalene.

10. A method of combating arthropods, fungi or bacteria which comprises applying to the anthropods, fungi or bacteria, or to a habitat thereof, an arthopodically, fungicidally or bactericidally effective amount of

1-(2-cyano-4-nitro-phenylamino)-2,4-dinitronaphthalene,

1-(2-cyano-4,6-dinitro-phenylamino)-2,4-dinitronaphthalene,

1-(2-methylsulfonyl-4-nitro-phenylamino)-2,4-dinitronaphthalene,

1-(2-nitro-4-trifluoromethyl-phenylamino)-2,4-dinitronaphthalene,

1-(3,5-bis-trifluoromethyl-phenylamino)-2,4-dinitronaphthalene,

1-(2-nitro-4,6-dichlorophenylamino)-2,4-dinitronaphthalene, or

1-(2,4-trifluoromethylphenylamino)-2,4-dinitronaphthalene.

4,183,950

COMBATING ARTHROPODS WITH 2,2-DIMETHYL-3-VINYL-CYCLOPROPANE CARBOXYLIC ACID ESTERS OF HALOGENATED BENZYL ALCOHOLS

Klaus Naumann, Cologne; Wolfgang Behrenz, Overath; Ingeborg Hammann, Cologne; Erich Klauke, Odenthal, and Albrecht Marhold, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

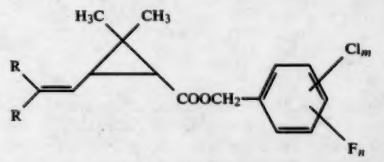
Filed Oct. 25, 1977, Ser. No. 844,852

Claims priority, application Fed. Rep. of Germany, Dec. 22, 1976, 2658074; Mar. 30, 1977, 2714042

Int. Cl.[2] C07C *69/74;* **A01N** *9/30*

U.S. Cl. 424—305 **9 Claims**

1. A 2,2-dimethyl-3-vinyl-cyclopropane carboxylic acid ester of a halogenated benzyl alcohol of the formula

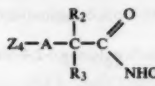


in which

each R independently represents F, Cl or Br
and m and n each independently represent 0, 1, 2, 3, 4 or 5 subject to the sum of m+n being not more than 5,
with the provisos that
(i) when each R represents F or Br then m and n cannot both be O, and
(ii) when each R represents Cl, then m represents 0, 1, 2, 3 or 4 and n represents 1, 2, 3, 4 or 5.

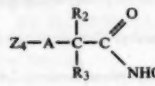
4,183,951
ACETOHYDROXAMIC ACIDS
Louis Lafon, Paris, France, assignor to Laboratoire L. Lafon, Maisons Alfort, France
Division of Ser. No. 778,543, Mar. 17, 1977, Pat. No. 4,122,186. This application Aug. 4, 1978, Ser. No. 930,925
Int. Cl.[2] A61K *31/185;* **C07C** *83/10*
U.S. Cl. 424—315 **14 Claims**

1. A compound of the formula



in which R_2 is H, CH_3 or C_2H_5, R_3 is H, Z_4 is adamantyl, α-naphthyl, β-naphthyl, 4-chlorophenyl, 3,4-dichlorophenyl, 2,6-dichlorophenyl, 4-aminophenyl, 3-trifluromethylphenyl or 3,4,5-trimethoxyphenyl, and A is —NHCO—, and its metal and acid addition salts.

10. A compound of the formula

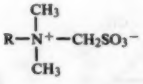


in which R_2 is H, CH_3 or C_2H_5, R_3 is H, Z_4 is phenyl or 4-chlorophenyl and A is —NHCONH— or —N(C_6H_5)CONH— and its metal and acid addition salts.

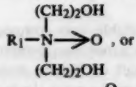
14. A pharmaceutical composition, comprising, in association with a pharmaceutically acceptable excipient, at least one compound according to claim **1** or claim **10**, or one of their non-toxic metal or acid addition salts.

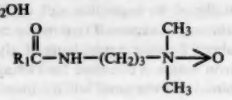
4,183,952
ANTIMICROBIAL COMPOSITIONS
Edwin B. Michaels, Gregory Ct., East Norwalk, Conn. 06855
Filed Dec. 18, 1975, Ser. No. 641,729
Int. Cl.[2] A61K *31/205*
U.S. Cl. 424—316 **8 Claims**

1. A broad spectrum antimicrobial composition having low toxicity which consists essentially of:
(a) 0.1 to 40 parts, by weight, of a higher alkyl-N-betaine said betaine having the structure:



where R is a higher alkyl of from 10 to 18 carbon atoms,
(b) 0.1 to 40 parts, by weight, of a higher alkyl-N,N-dimethylamine oxide, a higher alkyl-N,N-dihydroxyethylamine oxide, or an acylamido t-amine oxide having the respective structure:





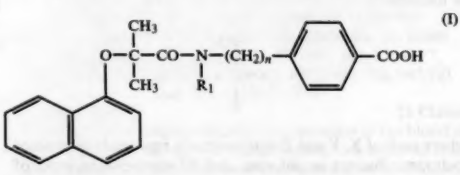
where R_1 is a higher alkyl of from 10 to 18 carbon atoms, or mixtures of the same, and
(c) a protonating agent, sufficient to adjust the pH of said composition from 4 to 5.5.

4,183,953
AQUEOUS AMMONIUM ISOBUTYRATE-ISOBUTYRIC ACID SOLUTION USEFUL FOR PRESERVING SEEDS, SILAGE, AND OTHER FEEDSTUFF
Ebbe R. Skov, Sao Paulo, Brazil; Roderick B. Judge, Montclair, and Geoffrey Hemphill, Manasquan, both of N.J., assignors to W. R. Grace & Co., New York, N.Y.
Continuation-in-part of Ser. No. 709,118, Jul. 27, 1976, abandoned, which is a continuation of Ser. No. 557,890, May 15, 1975, abandoned, which is a continuation-in-part of Ser. No. 407,106, Oct. 17, 1973, Pat. No. 3,899,588, which is a continuation-in-part of Ser. No. 304,462, Nov. 7, 1972, Pat. No. 3,786,086. This application Mar. 22, 1978, Ser. No. 889,010
Int. Cl.[2] A01N *9/02, 9/24*
U.S. Cl. 424—317 **11 Claims**

1. A solution useful for preventing rot and mildew from forming on feedstuff including seeds, said solution: (a) consisting essentially of water, ammonium isobutyrate, and isobutyric acid; and (b) having: (i) a nominal ammonium isobutyrate content of about 54–62%; (ii) an actual isobutyric acid content of about 2.5–8%; (iii) a crystallization temperature of about −20° F. to about −40° F.; and (iv) a pH of about 6.8–7.2.

4,183,954
BENZOIC ACID DERIVATIVES AND THERAPEUTIC COMPOSITION CONTAINING THE SAME
Aldo Bertelli, Milan, Italy, assignor to Seuref A.G., Vaduz, Liechtenstein
Filed Apr. 12, 1978, Ser. No. 895,852
Claims priority, application France, Apr. 27, 1977, 77 12788
Int. Cl.[2] A61K *31/195;* **C07C** *101/42, 101/60*
U.S. Cl. 424—319 **6 Claims**

5. A therapeutic composition having, in particular, choleretic, antiatherosclerotic, hypocholesterolemic and antiphlogistic activities comprising, as active ingredient, an effective amount of a compound having the general formula:



(I)

in which R_1 is a hyrogen atom or a lower alkyl radical and n is zero or an integer from 1 to 4, and their salts with therapeutically administrable inorganic or organic bases, and a therapeutically acceptable carrier.

4,183,955

TROPONYL-OXAMIC ACID DERIVATIVES FOR TREATING ALLERGIC CONDITIONS

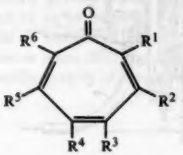
Jehan F. Bagli, Kirkland, and Tibor Bogri, Montreal, both of Canada, assignors to Ayerst. McKenna & Harrison Limited, Montreal, Canada

Division of Ser. No. 801,488, May 31, 1977, Pat. No. 4,125,625, which is a continuation-in-part of Ser. No. 697,296, Jun. 17, 1976, Pat. No. 4,057,556. This application Aug. 31, 1978, Ser. No. 938,558

Int. Cl.[2] A61K *31/16;* **C07C** *102/00*

U.S. Cl. 424—320 **5 Claims**

1. A compound of formula I



in which R^1 and R^4 are the same or different selected from the group consisting of hydrogen, halo, trifluoromethyl, lower alkoxy, lower alkyl, phenyl, hydroxy, phenoxy, mercapto, (2-carboxyphenyl)thio, NR^7R^8 wherein R^7 and R^8 each is hydrogen or lower alkyl or R^7 is lower alkyl and R^8 is p-toluenesulfonyl, and a radical of formula NR^9COR^{10} wherein R^9 is hydrogen or lower alkyl and R^{10} is hydrazinocarbonyl and R^2, R^3, R^5, and R^6 are the same or different selected from the group consisting of hydrogen, halo, trifluoromethyl, lower alkoxy, lower alkyl, phenyl, hydroxy, phenoxy, mercapto, (2-carboxyphenyl)thio and NR^7R^8 wherein R^7 and R^8 each is hydrogen or lower alkyl or R^7 is lower alkyl and R^8 is p-toleuensulfonyl; with the proviso that at least one of R^1 and R^4 must be a radical of formula NR^9COR_{10} wherein R^9 and R^{10} are as defined herein; or a therapeutically acceptable salt thereof.

4. A method for suppressing allergic manifestations of anaphylactic reactions and atopic hypersensitivity in a mammal which comprises administering to said mammal an effective amount of a compound of claim 1, or a therapeutically accceptable salt thereof.

4,183,956

METHOD FOR TREATING GASTROINTESTINAL SPASMS, GASTROINTESTINAL HYPERACIDITY AND HYPERTENSIVE DISORDERS WITH AMIDINOUREAS

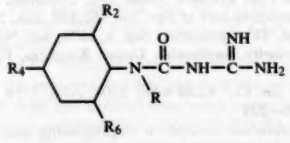
Julius Diamond, Morris Plains, N.J., and Jerome J. Zalipsky, Melrose Park, Pa., assignors to William H. Rorer, Inc., Fort Washington, Pa.

Continuation of Ser. No. 629,208, Nov. 5, 1975, abandoned, which is a continuation-in-part of Ser. No. 379,773, Jul. 16, 1973. This application Oct. 17, 1977, Ser. No. 842,994

Int. Cl.[2] A61K *31/17*

U.S. Cl. 424—322 **45 Claims**

1. A method for treating gastrointestinal spasms comprising administering to a patient suffering from said gastrointestinal spasms a therapeutically effective amount between 0.5 mg and 500 mg per dosage unit of at least one compound of the formula:



where:

R is hydrogen or loweralkyl;

R_2 is halo;

R_4 is hydrogen, halo or loweralkyl;

R_6 is hydrogen, halo, loweralkoxy, nitro, loweralkylsulfonyl or haloloweralkyl; and

the non-toxic acid addition salts thereof.

4,183,957

N'-(SUBSTITUTED PHENYL)-N-(2-(HALOPHENOXY)ETHYL)ALKYLANIMIDAMIDES

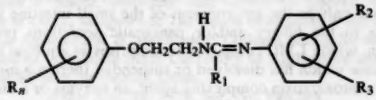
Chester E. Pawloski, Bay City, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Sep. 25, 1978, Ser. No. 945,158

Int. Cl.[2] C07C *123/00;* **A61K** *31/155*

U.S. Cl. 424—326 **6 Claims**

1. A compound of the formula



wherein R is Cl, Br or F; R_1 is C_1–C_6 alkyl; R_2 and R_3 are independently selected from H, halogen, or C_1–C_3 alkyl; and n is 0, 1, 2 or 3.

4,183,958

FUNGICIDAL 1-(ALKOXYPHENYL)-5-(SUBSTITUTED PHENYL) BIGUANIDE COMPOUNDS

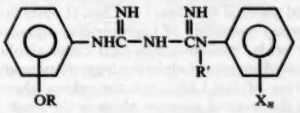
Michael J. Brown, Randolph; Bruce M. Resnick, West Paterson, and James H. R. Woodland, Bloomingdale, all of N.J., assignors to GAF Corporation, New York, N.Y.

Filed Sep. 26, 1978, Ser. No. 945,834

Int. Cl.[2] A01N *9/20;* **C07C** *129/12*

U.S. Cl. 424—326 **12 Claims**

1. A method of protecting living plants, comprising contacting said plant with a fungicidally acceptable amount of 1-(alkoxyphenyl)-5-(substituted phenyl) biguanides having the formula:



wherein

R is alkyl C_4–C_{14},

R' is hydrogen or alkyl C_1–C_5,

X is halo, nitro, cyano, trihalomethyl, alkyl C_1–C_8, alkoxy C_1–C_8, phenoxy, alkoxycarbonyl C_2–C_4 or acetyl,

n is 1 or 2, and, fungicidally acceptable acid addition salts thereof.

4,183,959

EMOLLIENT-CONTAINING UREA-BASED BATH BEAD COMPOSITION AND THE PRODUCTION THEREOF

Donald C. Wood, Des Plaines, and Robert L. McLaughlin, Wilmette, both of Ill., assignors to DeSoto, Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 635,282, Nov. 26, 1975, and Ser. No. 699,982, Jun. 25, 1976, Pat. No. 4,093,745. This application May 1, 1978, Ser. No. 901,855

Int. Cl.[2] A61K *7/46, 7/50;* **C11B** *9/00*

U.S. Cl. 424—358 **10 Claims**

1. An emollient-containing urea bath bead composition which produces little or no foam in the bath water comprising

urea prills having absorbed therein from 0.2% to 2.0% of an oily perfume and from 0.3% to 2.0% of a water soluble polyalkylene ether emollient constituted by aliphatic alcohols having from 8–22 carbon atoms adducted with from 6–12 mols of ethylene oxide per mol of alcohol, based on the weight of the urea prills, whereby the formation of an oily scum when the bath bead composition is dissolved in water is minimized.

4,183,960

DETOXIFICATION BY MEANS OF THE CONTROLLED, IN VIVO SECRETION TRIGGERED RUPTURE OF LIQUID MEMBRANE CAPSULES

William J. Asher, Fanwood, and Tina C. Vogler, South Orange, both of N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Feb. 1, 1978, Ser. No. 874,247
Int. Cl.[2] A61K *47/00, 37/48*
U.S. Cl. 424—365 **12 Claims**

1. A liquid membrane capsule (LMC) composition which ruptures only in the environment of the small intestine in response to the biliary and/or pancreatic secretions present therein, which LMC composition comprises an aqueous internal phase which has dissolved or suspended therein a medicinal, a nontoxic toxin complexing agent, an enzyme or a dietary supplement; a nonaqueous nontoxic oil external phase and an aqueous suspending phase, wherein the nonaqueous oil external phase comprises a nontoxic oil component and a material capable of solubilization by or interaction with the biliary and/or pancreatic secretions in the intestinal tract, wherein said material is a Class I or Class II polar lipid selected from the group consisting of triglycerides, diglycerides, long chain fatty acids, medicinal (C_6–C_{14}) chain alcohols, monoglycerides, acid soaps and alpha-hydroxy fatty acids.

6. A method of in-vivo detoxification consisting of the oral ingestion of a liquid membrane capsule (LMC) composition which ruptures only in the environment of the small intestine in response to the biliary and/or pancreatic secretions present therein, which LMC composition comprises an aqueous internal phase, which aqueous internal phase has dissolved or suspended therein a medicinal, a nontoxic toxin complexing agent, an enzyme or a dietary supplement; a nonaqueous nontoxic oil external phase and an aqueous suspending phase, wherein the nonaqueous oil external phase comprises a nontoxic oil component and a material capable of solubilization by or interaction with the biliary and/or pancreatic secretions in the tract 1 wherein said material is a Class I or Class II polar lipid selected from the group consisting of triglycerides, diglycerides, long chain fatty acids, medicinal (C_6–C_{14}) chain alcohols, monoglycerides, acid soaps and alpha-hydroxy fatty acids, resulting in the rupture of the LMC and the release thereby of the contents of the internal aqueous phase in the small intestine.

4,183,961

METHOD OF OXYGENATING BLOOD

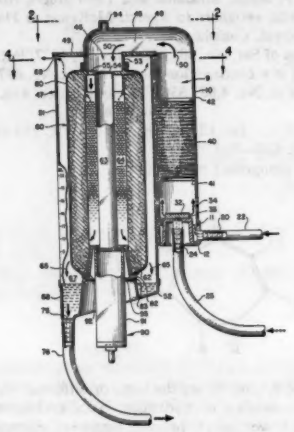
Robert M. Curtis, Laguna Niguel, Calif., assignor to Shiley Incorporated, Irvine, Calif.

Continuation-in-part of Ser. No. 655,039, Feb. 3, 1976, Pat. No. 4,067,696. This application Jul. 21, 1977, Ser. No. 817,643
Int. Cl.[2] A61K *45/00, 35/14*
U.S. Cl. 424—366 **2 Claims**

1. The method of oxygenating venous blood, comprising the steps of:

introducing bubbles of oxygen into said venous blood to provide a venous blood and oxygen bubble mixture;

flowing said mixture along tortuous paths through a three-dimensional, open-cellular mixing material for mixing and churning said blood and oxygen bubbles together sufficiently to disturb the diffusion boundary layers at the surfaces of said bubbles, said mixing material providing a plurality of tortuous paths so that said bubbles are broken down in size and caused to travel in a plurality of tortuous paths through the blood before said mixture escapes from said mixing material in the form of blood and blood foam, said mixing material having a void volume which is sufficient to produce low blood flow impedance and low blood flow velocity;



containing the blood and blood foam which emerge from said mixing material; and

defoaming said contained blood and blood foam for producing arterialized whole blood.

4,183,962

PROCESS FOR OXYGENATING BLOOD BY THE UTILIZATION OF LIQUID MEMBRANES

William J. Asher, Fanwood, N.J., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Jan. 16, 1978, Ser. No. 869,838
Int. Cl.[2] A61K *45/00, 31/02, 31/025*
U.S. Cl. 424—366 **14 Claims**

1. An improved process for oxygenating blood comprising contacting said blood with gaseous oxygen-containing bubbles, said bubbles being coated with a liquid membrane, said liquid membrane permitting the permeation of oxygen into the blood whereby at least a portion of said oxygen passes through said membrane and into said blood; removing said liquid membrane coated bubbles as a three phase foam comprising gas bubbles coated with said liquid membrane suspended in blood; and coalescing said foam comprising gas bubbles to form three separate bulk phases comprising the liquid membrane phase, a gaseous phase and a blood phase, wherein the improvement comprises a liquid membrane phase comprising a biologically non-retainable C_6-C_{25} liquid per-halocarbon compound or a mixture of biologically non-retainable liquid per-halocarbon compounds, wherein at least 50% of any of said per-halocarbon which may be introduced into the treated animal by said process is eliminated from the treated animal after four months.

4,183,963

CONTINUOUS FOOD IMPREGNATION

Christopher J. B. Brimelow, Beaconsfield, and John E. Brittain, Slough, both of England, assignors to Societe d'Assistance Technique Pour Produits Nestle S.A., Lausanne, Switzerland

Continuation-in-part of Ser. No. 762,650, Jan. 26, 1977, abandoned. This application Sep. 6, 1978, Ser. No. 939,893
Claims priority, application United Kingdom, Feb. 2, 1976, 4004/76
Int. Cl.[2] A23B *4/00, 5/00, 7/08, 7/14*
U.S. Cl. 426—321 **23 Claims**

1. A continuous method of impregnating and preserving food material which comprises:

(a) immersing pieces of food material into a concentrated

impregnating solution having a specific gravity greater than that of the food pieces whereby said pieces are buoyant in said solution; and

(b) passing the solution containing said food pieces along a flow path to a separation zone wherein the impregnating solution flows downward at a rate greater than the flow rate of said pieces until those pieces whose specific gravity, by absorption of the impregnant, substantially equals the specific gravity of the impregnating solution, lose their buoyancy and are carried downward by said solution and are continuously separated from those pieces which have not absorbed enough impregnant to substantially equal the specific gravity of the impregnating solution;

the specific gravity of the impregnating solution being preselected so as to impart to the impregnated pieces of food material an amount of impregnant sufficient to preserve said food pieces when their specific gravity is substantially equal to the specific gravity of the initial impregnating solution.

4,183,964

PROCESS FOR MANUFACTURING SAUSAGES

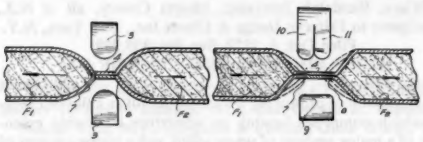
Isaac Vinokur, Av. Forest 1485, 1427 Buenos Aires, Argentina

Filed Jul. 20, 1978, Ser. No. 926,344

Claims priority, application Argentina, Jul. 29, 1977, 268612

Int. Cl.[2] B65B *7/02, 9/12*

U.S. Cl. 426—412 **3 Claims**



1. In a process for manufacturing sausages which comprises stuffing a meat emulsion into a thermosealable tubular casing, sealing said casing and cooking the product, the improvement which comprises effecting said sealing by making a preliminary thermoseal, prior to at least partially cooking the product, and then effecting a final thermoseal, after at least partially cooking the product, at the site of the preliminary thermoseal but wider than the preliminary seal thereby compressing the at least partly cooked meat into the unsealed portion of the tube.

4,183,965

2- AND 3-CYCLOTETRADECEN-1-ONES AS BITTERNESS DEPRESSANTS

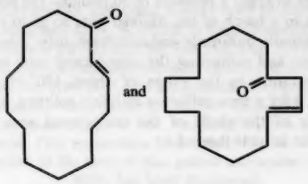
Braja D. Mookherjee, Holmdel; Robert W. Trenkle, Bricktown; Manfred H. Vock, Locust; Domenick Luccarelli, Jr., Ocean; Frederick L. Schmitt, Holmdel; Gilbert Stork, Englewood, all of N.J.; Timothy MacDonald, Nashville, Tenn., and Arthur L. Liberman, Highlands, N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Filed Dec. 26, 1978, Ser. No. 973,093

Int. Cl.[2] A23F *1/04;* **A23L** *1/22, 1/226;* **C12C** *3/00*

U.S. Cl. 426—548 **2 Claims**

1. A process for dibittering the taste of a consumable material having this property and selected from the group consisting of coffee, hops and artificial sweeteners comprising the step of adding to said consumable material about 0.001 ppm of one or more 2- and 3-cyclotetradecen-1-ones having a structure selected from the group consisting of:



4,183,966

METHOD OF MANUFACTURING A HIGH PROTEIN SNACK FOOD

James B. Mickle, deceased, late of Stillwater, Okla. (by Lois T. Mickle, widow and legally appointed agent of the executor); Wanda J. Smith, Stillwater, and Laurel M. Dieken, Tulsa, both of Okla., assignors to The Board of Regents of the Oklahoma Agricultural & Mechanical Colleges acting for and on behalf of Oklahoma State University of Agriculture and Applied Science, Stillwater, Okla.

Filed Apr. 14, 1978, Ser. No. 896,348

Int. Cl.[2] A23J *1/18, 1/20*

U.S. Cl. 426—42 **5 Claims**

1. A method of manufacturing a high protein snack food comprising:

a. inoculating whey with *Kluyveromyces fragilis* yeast;

b. incubating the mixture under continuous aeration at about 35° C. until substantially all the whey lactose has been utilized by the yeast;

c. heating the cultured whey to about 89° C. to precipitate the whey protein;

d. recovering the precipitated whey protein under moisture removal conditions to form a whey protein paste;

e. mixing the whey protein paste with egg whites, salt, a leavening agent selected from the group consisting of baking powder and baking soda, and a filler selected from the group consisting of dehydrated potato flakes, corn starch, and mixtures thereof;

f. shaping the mixture of step (e) into snack-like pieces;

g. frying the pieces in deep fat; and

h. cooking the fried pieces in a microwave oven to complete the cooking to a selected level of crispness.

4,183,967

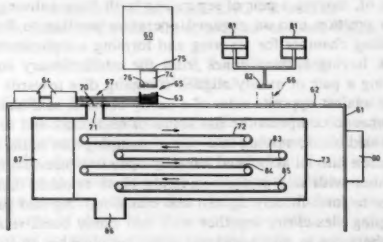
PROCESS FOR SPLITTING PISTACHIO NUTS

William B. Nelson, Wickham Bishops, and Gordon J. Barnes, Romford, both of England, assignors to Gunson's Sortex Limited, London, England

Filed Jan. 31, 1978, Ser. No. 873,886

Int. Cl.[2] A23P *1/00;* **A23L** *1/36*

U.S. Cl. 426—460 **17 Claims**



1. A process for splitting the shells of pistachio nuts comprising soaking the nuts with an aqueous liquid at a temperature below the boiling point for a period of up to about four hours,

draining the aqueous liquid from the nuts, employing a pressure member to apply a pressure of 70 pounds–150 pounds per square inch to a batch of the drained nuts so as to compress them substantially uniformly and simultaneously, releasing the said pressure, and subjecting the compressed nuts to an elevated temperature in the range of about 180° to 350° F. (82°–177° C.) for a time sufficient to effect splitting of at least the majority of the shells of the compressed nuts without damaging the kernels thereof.

4,183,968

METHOD FOR PRODUCTION OF CANDIES FROM A STRAND OF CONFECTION

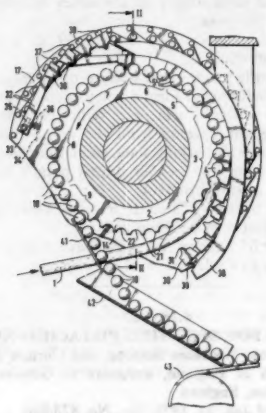
Hans Beckers; Paul-Werner Jung, both of Monchen-Gladbach; Herbert Bovians, Viersen, all of Fed. Rep. of Germany; Johann M. Heyer, deceased, late of Viersen, Fed. Rep. of Germany (by Adele Heyer, heir); Hans P. Heyer, heir, Viersen, and Marlene Wanders, heir, Beuggen, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Sep. 28, 1977, Ser. No. 837,338

Claims priority, application Fed. Rep. of Germany, Sep. 28, 1976, 2643855

Int. Cl.[2] A23G *3/00*

U.S. Cl. 426—512 **1 Claim**



1. A method of forming candy blanks from a cylindrical confectionary strand having a liquid filling comprising the steps of, moving a pair of separating teeth from a disengaged open position into an engaged operative position to form a blanking chamber for severing and forming a separate candy blank having seamed zones from the confectionary strand, moving a pair of axially aligned stamping dies towards each other against opposite sides of a candy blank in said blanking chamber to compress the flat seams of said blank and to preform said blank, moving said pair of stamping dies in the same direction into an associated laterally open one-piece stamping chamber with said preformed candy blank retained therebetween to form-fittedly tighten said blank, moving said pair of stamping dies closer together with said candy blank retained therebetween in said associated stamping chamber to form a finished candy blank free of flash overflow, moving said pair of stamping dies apart with said finished candy blank disposed in said associated stamping chamber and ejecting said finished candy blank from said associated stamping chamber.

4,183,969

FOODSTUFFS CONTAINING CROSSLINKED STARCHES USING STMP

Roger W. Rubens, Somerville, N.J., assignor to National Starch and Chemical Corporation, Bridgewater, N.J.

Filed Mar. 20, 1978, Ser. No. 888,382

Int. Cl.[2] A23L *1/195*

U.S. Cl. 426—578 **3 Claims**

1. A foodstuff comprising a foodstuff and, as a thickening agent therefor, a cold water swelling starch characterized by its resistance to Brabender viscosity breakdown on heating from 30° to 95° C. prepared from a dual derivatizing process comprising the steps of:

a. reacting a granular starch base in a primary crosslinking step with sodium trimetaphosphate in an aqueous slurry at a pH of 10–12 and a temperature sufficiently low to maintain the starch in an unswollen granular state;
b. neutralizing the slurry to a pH of 5–6.5;
c. recovering the primary crosslinked granular starch;
d. reslurrying the resultant starch in water at a pH of at least 7.5 and adding thereto additional sodium trimetaphosphate;
e. drum drying the resultant slurry to effect a secondary crosslinking reaction in situ; and
f. recovering the dried cold water swelling starch product.

4,183,970

PREPARATION OF A FLAVOR EXTENDER FROM WHEY

William A. May, Morristown, N.J.; Ivan R. Fernandez, Brooklyn, N.Y.; Patrick P. Donohue, Old Bridge, and Alphonse J. DiCara, Randolph Township, Morris County, all of N.J., assignors to Fritzche Dodge & Olcott Inc., New York, N.Y.

Filed Oct. 4, 1977, Ser. No. 839,208

Int. Cl.[2] A23C *21/00*; A23G *1/00*; A23F *1/14*

U.S. Cl. 426—583 **23 Claims**

1. A method of producing a material useful as a flavor extender which comprises heating an admixture consisting essentially of a major amount of whey solids and a minor amount of liquid water at a temperature above 100° to about 200° C. and at a pressure of from about 10 to 200 pounds per square inch sufficient to maintain water in the admixture undergoing heating in the liquid phase for a period of time of at least five minutes, and cooling the resulting admixture to a temperature below 100° C. to produce a processed whey solids material useful as a flavor extender.

4,183,971

HARD BUTTER

Seigi Minowa; Toshiro Tanaka, and Nozomi Yasuda, all of Tokyo, Japan, assignors to Asahi Denka Kogyo K.K., Tokyo, Japan

Filed Oct. 12, 1977, Ser. No. 841,399

Claims priority, application Japan, Oct. 15, 1976, 51-123551

Int. Cl.[2] A23D *5/00*

U.S. Cl. 426—607 **5 Claims**

1. A hard butter having an iodine value of 52 to 75, a melting point of 30° to 40° C., a C_{16} saturated fatty acid content of 10 to 30% by weight, a C_{18} saturated fatty acid content of 2 to 10% by weight, a C_{18} mono-unsaturated fatty acid content of 55 to 75% by weight and a trans-isomer content of 40 to 70% by weight based on the total weight of combined fatty acids, said hard butter consisting essentially of

(a) 50 to 100% by weight of a first hardened oil obtained by hydrogenating with isomerization a rice bran oil having an iodine value of 97 to 108 and a C_{16} saturated acid content of 15 to 22% by weight based on the total weight of combined fatty acids and containing 1.0 to 4.0% by weight, based on the rice bran oil, of higher alcohol fatty acid esters of which the higher alcohols are unsaponifiable matters of said rice bran oil, a fraction obtained by fractionation of the first hardened oil, or mixture thereof, and

(b) 50 to 0% by weight of a second hardened oil obtained by hydrogenating with isomerization a vegetable oil substantially free of tri-saturated glycerides and having a C_{16} saturated fatty acid content of 12 to 30% by weight and a C_{18} diunsaturated acid content of 30 to 55% by weight based on the total weight of combined fatty acids, a fraction obtained by fractionation of the second hardened oil, or mixture thereof.

4,183,972

POTASSIUM BROMATE COMPOSITION

Frederick D. Vidal, Bergen, and Albert B. Gerrity, Monmouth, both of N.J., assignors to Pennwalt Corporation, Philadelphia, Pa.

Filed Apr. 5, 1978, Ser. No. 893,555
Int. Cl.[2] A21D *10/00*
U.S. Cl. 426—653 **14 Claims**

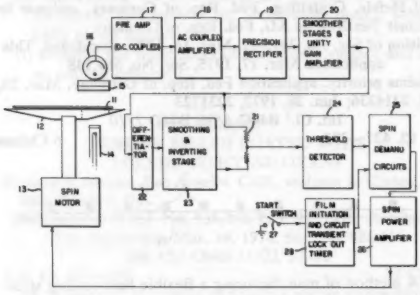
1. A composition for improving flour and dough consisting of a powdery mixture of potassium bromate with, for each 100 parts of by weight of said bromate, from about 30 up to about 125 parts of an inert, edibly acceptable, flame retardant phosphate salt and additionally an inert, edibly acceptable hydrate salt which provides no more than about 50 parts by weight of water per 100 parts by weight of said bromate, said hydrate salt being present in an amount at least sufficient to reduce the fire and/or explosion hazard of the composition when mixed with equal proportions of flour or starch.

4,183,973

CONTROL SYSTEM FOR A SLIDE CENTRIFUGE

Robert C. Beaty, Raleigh, N.C., and Gerald R. Mansfield, Painted Post, N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed Apr. 12, 1978, Ser. No. 895,595
Int. Cl.[2] G01N *21/00, 21/24*
U.S. Cl. 427—2 **2 Claims**



1. A method of producing a slide having a monolayer of blood cells thereon comprising:

placing a blood sample on said slide,

spinning said slide in a centrifuge,

measuring the absorption of light passing through said slide, the intensity of said light being correlated with the density of blood cells in said film, determining the ratio between the measured amount of light absorbed and the rate of change of the measured amount of absorbed light, and

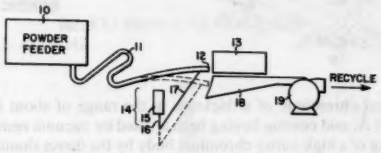
stopping the spinning when said ratio reaches a predetermined level.

4,183,974

CONTAINER COATING METHOD

Robert G. Coucher, and Gene Gerek, both of Salt Lake City, Utah, assignors to W. R. Grace & Co., Cambridge, Mass.

Continuation-in-part of Ser. No. 430,094, Jan. 2, 1974, Pat. No. 3,962,486, and a continuation-in-part of Ser. No. 486,464, Jul. 8, 1974, Pat. No. 3,947,617, and a continuation-in-part of Ser. No. 526,735, Nov. 25, 1974, Pat. No. 4,025,664, and a continuation-in-part of Ser. No. 558,787, Jun. 20, 1975, abandoned. This application Mar. 24, 1977, Ser. No. 780,607
The portion of the term of this patent subsequent to May 24, 1994, has been disclaimed.
Int. Cl.[2] B05D *7/22, 3/02*
U.S. Cl. 427—28 **29 Claims**



1. Method for applying an ultra thin resinous coating less than 1 mil in thickness to the entire interior surfaces of a plurality of thin-walled, cylindrical, metal beverage containers having an open end and a closed end, comprising:

heating each container until at least its bottom is above the softening point of a selected resin;

moving the thus heated containers in a sequence through an application zone, and while each container is in said application zone, and said bottom is above the softening point of said resin, introducing at least one pulse of said resin in finely divided solid form with maximum individual particle diameters of less than about 20 microns, said resin being suspended in a carrier gas, approximately axially toward the closed end of said container through the open end of said container from a region outside the container at a velocity sufficient to project particles of resin to the bottom of said container, thereby to cover substantially the entire interior surface of said container with a resinous coating;

causing said resin particles to adhere to the interior surface of the sidewalls of said container by either heating said sidewalls to above the softening point of said resin, imposing tribo-electric charges on said resin particles or both heating said sidewalls to above the softening point of said resin and imposing tribo-electric charges on said resin particles; and

moving the containers in sequence from said application zone and curing said coating into an adherent, solventfree, substantially continuous film.

4,183,975

VACUUM METALLIZING PROCESS

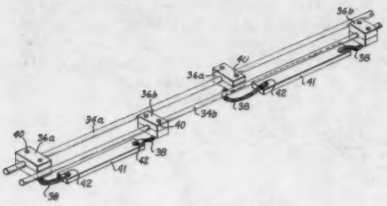
Jerry F. Sidders, Urbana, Ohio, assignor to Dare Pafco, Inc., Urbana, Ohio

Filed Mar. 16, 1978, Ser. No. 887,260
Int. Cl.[2] B05D *3/06*
U.S. Cl. 427—50 **9 Claims**

1. A process for applying a bright chromium coating, said coating having substantially the color and appearance of bright electroplated chromium, to the surfaces of articles in a vacuum comprising the steps of securing a high purity chromium body between spaced electrodes in a chamber, said chromium having a purity of about 99.9% or better, mounting the article to be coated in spaced relation to said body, evacuating said chamber to a pressure of at least about 5×10^{-5} mm Hg, passing a current directly through said body to evaporate metal from the surface thereof, and condensing the evaporated metal on the surfaces of said article to be coated, said process being

carried out for a time sufficient to apply a chromium coating to said article having a thickness in the range of 800 to 1000 Å.

7. An article of manufacture comprising a substrate and an adherent, uniform bright chromium coating, said coating having substantially the color and appearance of bright electro-



plated chromium, of a thickness in the range of about 800 to 1000 Å, said coating having been applied by vacuum resistance firing of a high purity chromium body by the direct shunting of electrical current therethrough in a vacuum of at least about 5×10^{-5} mm Hg.

4,183,976

PROCESS OF PRODUCING A MAGNETIC RECORDING ELEMENT

Yasuyuki Yamada, and Tatsuji Kitamoto, both of Odawara, Japan, assignors to Fuji Photo Film Co., Ltd., Ashigara, Japan

Continuation-in-part of Ser. No. 728,081, Sep. 30, 1976, abandoned. This application Jan. 17, 1978, Ser. No. 870,146

Claims priority, application Japan, Oct. 1, 1975, 50-118541

Int. Cl.[2] H01F *10/00*

U.S. Cl. 427—130 **7 Claims**

1. A process of producing a magnetic recording element comprising a non-magnetic support having provided thereon a subbing layer and further provided thereon a magnetic layer comprising ferromagnetic powders and a binder, which comprises coating a subbing solution at a temperature of 100° C. or below in a dry thickness of about 0.03 to about 2.0 μm, drying the coated layer and then coating the magnetic recording layer thereon, said non-magnetic support being a biaxially stretched polyester, and said subbing solution having a solids concentration of about 0.8 to 5 wt% and comprising

(a) an amorphous linear saturated polyester resin prepared from an aromatic dicarboxylic acid and a glycol in a molar ratio of aromatic dicarboxylic acid to glycol of 1:2 to 1:3,

(b) a vinylidene chloride-acrylonitrile copolymer or a vinylidene chloride-methacrylonitrile copolymer, each having a nitrogen content of about 1 to 6%, said copolymer being present in an amount of about 10 to about 50 wt % to said polyester resin, and

(c) an organic solvent mainly composed of about 50 to about 100% by weight methyl ethyl ketone based on the total weight of organic solvent.

4,183,977

METHOD OF AUTO-GLAZING WOOD

David J. Burkey, Millersville, and Lawrence Clark, Lancaster, both of Pa., assignors to Armstrong Cork Company, Lancaster, Pa.

Filed Sep. 1, 1978, Ser. No. 938,825

Int. Cl.[2] B05D *3/12, 5/00*

U.S. Cl. 427—199 **1 Claim**

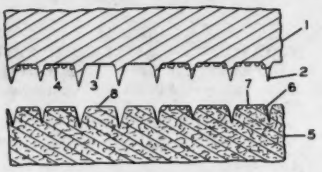
1. A method of decorating a wood grain surface comprising the steps of:

(a) embossing a wood grain detail on a fiberboard surface with an embossing plate to produce a indented line pattern with raised areas therebetween,

(b) at least finishing the embossed surface with a glaze coating, and

(c) the improvement comprising:

(1) depositing in selected areas of the embossing plate, prior to step (a), primarily in the areas of the plate corresponding to said raised areas of the fiberboard, a spray of metal particles to cause a roughened embossing surface in those selected areas so that when embossing step (a) is carried out, there will be a roughening of some of the raised areas of the embossed surface, and



(2) after the glaze coating is applied, uniformly wiping the embossed surface to remove most of the coating from the raised areas of the wood grain detail, leaving the glaze coating in greater concentrations in the selected areas of the wood grain detail which have been roughened by the selected areas of the embossing plate that were treated by the spray of metal particles, whereby the raised surfaces of the wood grain detail which have not been roughened will be wiped relatively clean of glaze while the roughened surfaces of the wood grain detail will retain more glazing than the non-roughened areas.

4,183,978

RASTER-LIKE COATING OF HEAT-SEALABLE ADHESIVES ON SUBSTRATES

Josef Hefele, Gräfelfing, Fed. Rep. of Germany, assignor to Kufner Textilwerke KG, Fed. Rep. of Germany

Division of Ser. No. 341,961, Mar. 16, 1973, abandoned. This application Mar. 17, 1975, Ser. No. 559,148

Claims priority, application Fed. Rep. of Germany, Mar. 23, 1972, 2214236; Jun. 28, 1972, 2231723

Int. Cl.[2] B44C *1/06;* **B44D** *1/10*

U.S. Cl. 427—202 **6 Claims**

1. A method of manufacturing a flexible heat-sealing structure comprising the steps of:

(a) applying a first raster layer of isolated spots of heat sealable adhesive to one side of a flexible substrate;

(b) applying a second raster layer of isolated spots of heat sealable adhesive on top of said first raster layer, spots of said second layer lying only on top of the spots of said first layer and thereby not in direct contact with said flexible substrate, the heat sealable adhesive of said first layer having lower thermoplastic flow properties than adhesive of said second layer,

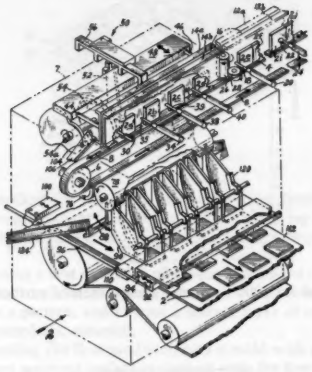
whereby the isolated spots on top of spots permit the heat-sealing structure to remain flexible after being secured to a textile article.

4,183,979

METHOD OF ALIGNING AND COATING

Arnold L. Kellermann, Goshen; David I. McDonald, Cincinnati, both of Ohio, and Robert J. Grone, Covington, Ky., assignors to Cincinnati Milacron Inc., Cincinnati, Ohio

Division of Ser. No. 809,799, Jun. 24, 1977, Pat. No. 4,104,984.
This application May 12, 1978, Ser. No. 905,381
Int. Cl.[2] B05D *1/28*
U.S. Cl. 427—211 8 Claims



1. A method of precisely placing a plurality of planar workpieces upon an outfeed conveyor, comprising the steps of:

(a) moving the workpieces in a predetermined direction along an infeed conveyor;

(b) spacing the workpieces upon the infeed conveyor;

(c) preventing workpiece motion in the predetermined direction and permitting relative movement between the workpiece and the infeed conveyor;

(d) moving the workpieces in a direction transverse to the predetermined direction to a location beyond the lateral terminus of infeed conveyor and permitting free-falling gravity biased workpiece movement;

(e) interrupting the free-falling gravity biased workpiece movement and guiding the workpieces onto a substantially planar surface; and

(f) scraping the workpieces off the planar surface and onto an outfeed conveyor.

4,183,980

PERLITE FILLER COATED WITH POLYDIMETHYLSILOXANE

Richard B. Nielsen, Los Angeles, Calif., assignor to Grefco, Inc., Bala Cynwyd, Pa.

Continuation of Ser. No. 734,456, Oct. 21, 1976, abandoned.
This application Mar. 14, 1978, Ser. No. 886,614
Int. Cl.[2] C04B *31/22, 31/26*
U.S. Cl. 427—215 17 Claims

13. A method of coating particulate perlite comprising the steps of:

(a) pre-sizing unexpanded particulate perlite ore;

(b) expanding said ore by heat treatment to an expanded particulate perlite;

(c) coating the individual particles of said expanded particulate perlite with a emulsion containing an organosilicon compound that will react to form polydimethylsiloxane to yield a coated particle of from 0.5 to 4.0 weight percent of said compound;

(d) drying said coating to a moisture content of less than 0.5% in a moving airstream; and

(e) strengthening said coating by heating the dried, coated perlite particles for a time and temperature sufficient to render the coated perlite particles substantially resistant to attrition.

4,183,981

LAUNDRY FINISHING TREATMENT ROPE AND METHOD

Werner Kunzel, Langenfeld; Karl Schwadtke, Leverkusen; Alexander Cioc, Dusseldorf; Michael Kik, Langenfeld, and Rolf Puchta, Haan, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Dusseldorf-Holthausen, Fed. Rep. of Germany

Filed Dec. 27, 1977, Ser. No. 864,537
Claims priority, application Fed. Rep. of Germany, Dec. 27, 1976, 2659018
Int. Cl.[2] B05D *3/12;* D06M *11/00*
U.S. Cl. 427—242 19 Claims

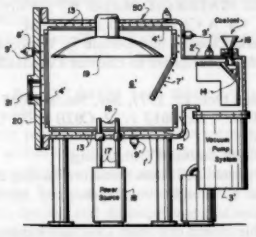
1. A laundry finishing treatment rope for use in a mechanical laundry drier comprising an entwined strand of textile fibers in a cord form having a diameter of from 0.3 to 2.5 cm and a length of from 10 to 50 cm, sufficient to make uniform contact with the moving articles of laundry when used in a mechanical laundry drier, and having both ends secured against fraying, said rope being impregnated with an amount of from 10% to 90% by weight of the weight of said rope, sufficient for conditioning one loading of a mechanical laundry drier, of a substance of the laundry finishing treatment type effective in a mechanical laundry drier.

4,183,982

FLUID PROTECTIVE WALL COVER IN A VAPOR DEPOSITION CHAMBER

Thaddäus Kraus, Triesen, Liechtenstein, assignor to Balzers Aktiengesellschaft für Hochvakuumtechnik und Dunne Schichten, Liechtenstein

Filed May 5, 1978, Ser. No. 903,173
Claims priority, application Switzerland, May 9, 1977, 005741/77
Int. Cl.[2] B05D *1/00;* C23C *11/00*
U.S. Cl. 427—248 R 8 Claims



1. A method of producing high vacuum in a closable container into which, at least during the flooding and while the

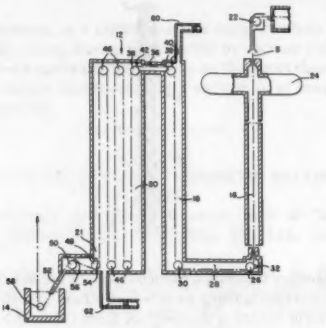
container is open, a protective gas is introduced to protect the inside wall from being charged with vapor, comprising screening the inside wall by a covering while introducing a protective gas into an intermediate space between the wall of the container and the covering, evacuating the container, and during the evacuation heating the covering.

4,183,983

METHOD FOR REDUCING METAL OXIDE FORMATION ON A CONTINUOUS METAL SHEET IN THE HOT DIP COATING THEREOF

Eugene A. Cook, Lansdale, and Chad F. Gottschlich, Philadelphia, both of Pa., assignors to Selas Corporation of America, Dresher, Pa.

Filed Aug. 17, 1978, Ser. No. 934,627
Int. Cl.[2] C23C *1/02*
U.S. Cl. 427—321 **15 Claims**



1. A method for reducing metal oxide deposition on a metal sheet advancing through an industrial furnace in the hot dip coating of a continuous sheet, said furnace having an exit end with a snout extending therefrom and into a hot dip coating bath, a cooling zone adjacent to said exit end for lowering the sheet temperature to a predetermined coating temperature, and other zones in said furnace for the heat processing of a sheet, said sheet traveling from said cooling zone into said snout, comprising the steps of:

(a) sealing at said exit end for the substantial reduction of metal vapor migration from the surface of said bath into said cooling zone by sealing said exit end and by conducting atmosphere from said cooling zone into said snout by the action of sheet advancement from said cooling zone into said snout, which action pulls along cooling zone atmosphere into said snout; and

(b) providing an atmosphere in said cooling zone which substantially reduces the oxidation of metal vapor which migrates into said furnace.

4,183,984

OIL SORBENT MATERIAL MADE BY OPENING CELLS OF A CLOSED CELL FOAM

Scott D. Browers, Cloquet, and Donald E. Wiegand, Minneapolis, both of Minn., assignors to Conwed Corporation, St. Paul, Minn.

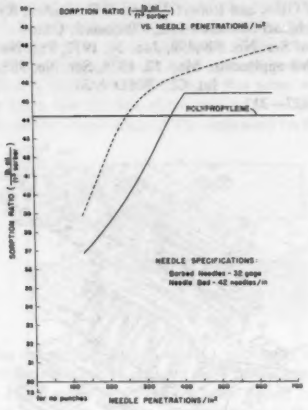
Filed Oct. 27, 1977, Ser. No. 846,035
Int. Cl.[2] B01D *39/16;* B01J *1/22;* C02B *9/02;* C08J *9/36*
U.S. Cl. 428—81 **15 Claims**

1. An oil sorbent material comprising:

(a) a flexible closed cell foam structure having at least about 50 percent by weight void space and having opposed surfaces;

(b) said flexible closed cell foam structure having from about 100 to about 700 cells per cross sectional square inch and a density of from about 1 to about 5 pcf;

(c) said flexible closed cell foam structure having at least a predominate portion of the closed cells opened through at least one said surface by needle punching with from about



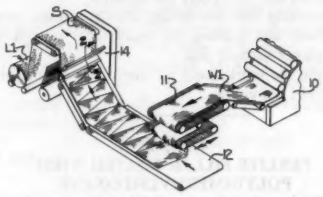
50 to about 1000 holes per square inch of surface dimension.

4,183,985

PROCESS OF PRODUCING A NONWOVEN NEEDLED NAPPED FABRIC HAVING SUPERIOR RESISTANCE TO PILLING AND SHEDDING

George W. Lemieux, Swannanoa, N.C., assignor to National Distillers and Chemical Corporation, New York, N.Y.

Filed Jan. 5, 1978, Ser. No. 867,124
Int. Cl.[2] B32B *5/06;* D04H *18/00*
U.S. Cl. 428—91 **18 Claims**



1. Process of producing a nonwoven needled napped fabric, adaptable for use in the formation of blankets and other types of products, characterized by providing superior resistance to pilling and shedding of the nonwoven fabric, said process comprising the steps of:

providing a multi-layer composite batt of textile fibers having an inner nonwoven supporting layer and outer layers of nonwoven fibers on each side of the supporting layer;

sequentially needling the batt of fibers from a first side to a second side thereof and then from the second side to the first side thereof to form a multiplicity of fiber entanglements for interlocking the fibers of the batt with each other to form an integrated needled fabric;

napping the first and second sides of the needled fabric for producing raised fiber surfaces on each side of the fabric; and

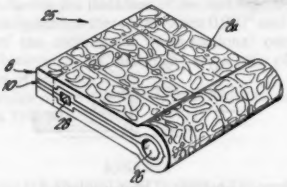
reneedling the needled and napped fabric from the first side to the second side only thereof for providing resistance to pilling and shedding of the nonwoven fabric.

4,183,986

METHOD FOR MAKING STRAPS

Matthias Blaetterlein, Watertown, Conn., assignor to Timex Corporation, Waterbury, Conn.

Filed Dec. 14, 1978, Ser. No. 969,636
Int. Cl.[2] B31F *1/00*; A45C *11/10*
U.S. Cl. 428—160 **27 Claims**



1. A method for making a laminated sheet from which a strap having a loop at least at one end for receiving the crosspin of a watch, buckle and the like can be cut, comprising the steps of:

(a) forming a first sandwich of at least a first layer of thermoplastic material, the free surface of which is embossable with a pattern, and at least a second layer of reinforcing thermoplastic material;

(b) inserting the first sandwich into a mold with a first patterned working surface in contact with the free surface of the first embossable layer and a second working surface with an elongated projection in contact with the free surface of the second reinforcing layer and heating said sandwich under pressure to not only bond said first and second layers together but also emboss the pattern on the free surface of the first layer and form an elongated groove, corresponding to said elongated projection, in at least the second layer;

(c) folding the bonded first sandwich onto itself about the longitudinal axis of the longitudinal groove to form a U-shaped second sandwich with the second reinforcing layer pressed onto itself and with a loop at one end formed by the folded-over groove portion;

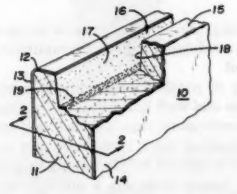
(d) bonding the second layer to itself by heating the second sandwich under pressure without closing the loop at said one end and without distorting the embossed free surface of the first layer.

4,183,987

KERFED EDGE GYPSUM BOARD HAVING IMPROVED EDGE STRENGTH

Lawrence T. Eby, Arlington Heights, Ill., and Nels Nelsson, New Port Richey, Fla., assignors to United States Gypsum Company, Chicago, Ill.

Filed Jul. 7, 1978, Ser. No. 922,881
Int. Cl.[2] B32B *31/18*; E04C *2/04*
U.S. Cl. 428—192 **10 Claims**



1. In a gypsum board having front and back faces terminating in edges, at least one of said edges having a kerf engageable with flanged supports, said kerf being disposed between said front and back faces and extending into the board along substantially the full length of said board, the kerf having opposing sidewalls and bottom surfaces:

the improvement wherein the kerf is cut by a pair of pressurized streams of aqueous liquid to form sidewalls inclined opposingly inwardly toward one another from said board edges, but do not intersect;

wherein said sidewalls incline inwardly toward one another defining therebetween an angle of from about 3° to about 20°;

wherein said sidewalls meet the bottom surface and are joined by said bottom surface;

wherein said bottom surface is of an uneven jagged profile characterized by alternately and irregularly spaced projections and depressions both longitudinal of and transverse to the board edge wherein said bottom surface meets each sidewall at a jagged intersection;

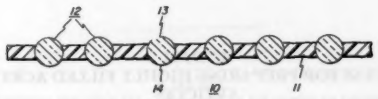
whereby the portions of said board defining said kerfed edge have enhanced strength in a direction generally perpendicular to the sidewalls to provide improved board retention by flanged supports over conventional mechanically sawn kerfed edge board of similar dimensions.

4,183,988

SOLID ION-CONDUCTIVE ELECTROLYTE

Gregory C. Farrington, Clifton Park, and Joseph L. Weininger, Schenectady, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Nov. 16, 1978, Ser. No. 961,259
Int. Cl.[2] H01M *6/16*
U.S. Cl. 429—193 **3 Claims**



1. A solid ion-conductive electrolyte comprising a polymer film having opposite surfaces, a plurality of solid polycrystalline ion-conductive particles embedded therein, and the particles exposed at both opposite surfaces of the film said particles are selected from the group consisting of beta-aluminas, beta "-aluminas, and mixtures thereof.

4,183,989

SECURITY PAPERS

Alan J. Tooth, Whitchurch, England, assignor to Portals Limited, Hampshire, England

Filed Nov. 29, 1977, Ser. No. 855,671
Claims priority, application United Kingdom, Dec. 7, 1976, 51047/76
Int. Cl.[2] B41M *3/14*; B44F *1/12*
U.S. Cl. 428—195 **13 Claims**

1. A security paper which contains a security device lying substantially within the body of the paper and having at least two distinct machine verifiable security features, a first of the security features being a magnetic material and the second feature being a second and different material selected from the group consisting of:

a. a luminescent material,

b. an x-ray absorbent, and

c. a non-magnetic metal.

4,183,990
STEP TABLET

Toshio Uchida; Yorimiti Yabuta; Hiroshi Noguchi; Eiichi Hasegawa, and Teppei Ikeda, all of Asaka, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Nov. 21, 1977, Ser. No. 853,794
Claims priority, application Japan, Nov. 22, 1976, 51-140963
Int. Cl.[2] B32B 7/02; G03C 5/04
U.S. Cl. 428—212 36 Claims

25. A step tablet with optical density steps of a definite shape, each step having a different specific optical density, disposed in a specific order, in which any two adjacent optical density steps have a boundary space of a specific shape therebetween wherein said boundary space comprises a portion transparent to actinic radiation and a portion not transparent to actinic radiation and said two portions contact the same two adjacent optical density steps.

4,183,991
PROCESS FOR PREPARING HIGHLY FILLED ACRYLIC ARTICLES

Leonard H. Smiley, Jenkintown, and Howard L. Tigelaar, Levittown, both of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Filed May 2, 1977, Ser. No. 793,229
Int. Cl.[2] B29D 7/00
U.S. Cl. 428—220 18 Claims

1. A process for preparing highly filled acrylic articles having a thickness of about 0.1 to 4.0 inch comprising:

(a) providing a solution of polymer in monomer, in a polymer:monomer ratio of from 1:9 to 1:1, wherein (i) said polymer is polymerized from a mixture comprising at least 50 percent by weight C_{1-8} alkyl methacrylates or mixtures thereof and 0.01 percent to 8 percent by weight copolymerizable ethylenically unsaturated carboxylic acid and is characterized by a molecular weight of from about 20,000 to 100,000; and (ii) said monomer comprises at least 50 percent by weight C_{1-8} alkyl methacrylate or mixtures thereof;

(b) mixing into said solution a catalytic amount of polymerization promoter system;

(c) blending into the mixture from (b) above 40 percent to 80 percent inert particulate filler, based on total amount, to form a casting mixture;

(d) introducing said casting mixture to a mold; and

(e) curing said casting mixture;

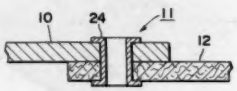
whereby the viscosity of said casting mixture is controlled and the settling of said filler is minimized by the presence of units from said carboxylic acid in said polymer.

16. A filled acrylic sheet having a thickness of about 0.1 to 4.0 inch prepared by the process of claim 1.

4,183,992
VIBRATION-ABSORBING HEAT-INSULATING PLATE

Yosuke Tsubaki, Toyota, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Continuation-in-part of Ser. No. 882,195, Feb. 28, 1978. This application Oct. 27, 1978, Ser. No. 955,455
Claims priority, application Japan, Jul. 25, 1978, 53-89682
Int. Cl.[2] B32B 7/00
U.S. Cl. 428—245 5 Claims



1. A vibration-absorbing heat-insulating plate which is mounted on a heat source such that there is a gap between the plate and a surface of said heat source, said vibration-absorbing heat-insulating plate comprising:

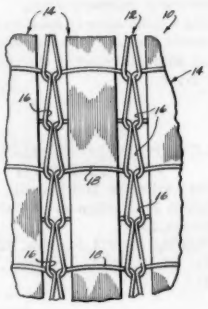
at least one portion made from metal which is provided adjacent the greatest thermal effect of said heat source; and

at least one vibration-absorbing portion integrally coupled to the metal portion adjacent the smallest thermal effect of said heat source, said vibration-absorbing portion being made from a cloth-like material formed by weaving filiform asbestos and metal wire together.

4,183,993
REINFORCED FABRIC AND LAMINATE MADE THEREWITH

Bryan C. Benstead, Walhalla, S.C., and Robert T. Seith, Tuscaloosa, Ala., assignors to Gulf States Paper Corporation, Tuscaloosa, Ala.

Filed Jan. 30, 1978, Ser. No. 873,542
Int. Cl.[2] B32B 7/00
U.S. Cl. 428—253 12 Claims



1. A reinforcing fabric for a resinous laminate comprising

a weft knit yarn fabric formed of a multiplicity of weft knit stitches and

a multiplicity of parallel longitudinally extending warp inserts held in said weft knit fabric by longitudinally extending stitch sections of yarn between said inserts and transversely extending stitch sections of yarn on opposite sides of said inserts spaced longitudinally therealong,

each of said inserts including a multiplicity of continuous monofilaments extending longitudinally in parallel relation with respect to one another without crimp or twist and grouped closely together so that the outline cross-sectional configuration of the group is approximately in the shape of an elongated rectangle, the elongated dimension

of which extends transversely in the plane of the reinforcing fabric and constitutes the width of the insert, the other dimension of which constitutes the thickness of the insert and corresponds to the thickness of the reinforcing fabric,

each monofilament of each insert being formed from a material taken from the group consisting of glass, carbon and aramid and having a cross-sectional diameter of between 0.00032" and 0.00095",

each insert having the thickness of the rectangular cross-sectional configuration thereof between 0.003" and 0.38", the width of the rectangular cross-sectional configuration thereof between 0.009" and 0.75" and a ratio of width-to-thickness of between 2 and 30,

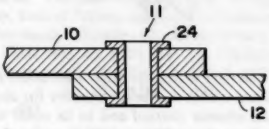
the total width of the inserts per yard width of fabric being between 55% and 98%.

4,183,994

HEAT INSULATING PLATE

Yosuke Tsubaki, Toyota, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Feb. 28, 1978, Ser. No. 882,195
Claims priority, application Japan, Jul. 25, 1977, 52-89682
Int. Cl.[2] B32B *15/00*
U.S. Cl. 428—253 **22 Claims**



1. A heat insulating plate comprising:

a heat resisting metal plate adapted to be secured to a heat source in slightly spaced apart relation to an outer surface of said heat source at a portion heavily affected by heat from said heat source; and

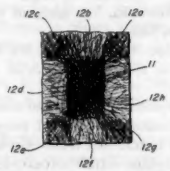
a vibration absorbing member substantially comprising asbestos integrally joined to said heat resisting metal plate in abutting relationship and disposed at a portion of said heat source which is lightly affected by heat from said heat source whereby vibrational noise from said heat insulating plate is reduced while providing heat insulation from said heat source.

4,183,995

OCTA-DIRECTIONAL NONWOVEN FABRIC

Preston F. Marshall, Walpole, Mass., assignor to The Kendall Company, Boston, Mass.

Filed Sep. 21, 1978, Ser. No. 944,424
Int. Cl.[2] B32B *1/00*
U.S. Cl. 428—284 **10 Claims**



1. A nonwoven fabric having octa-directionally oriented fabric strands comprising:

an unlayered nonwoven web having substantially no apertures therein and having a repeating pattern of high fiber density areas, each of which are surrounded by low fiber density areas;

said low fiber density areas interconnect said high fiber density areas and are composed of substantially parallelized strands of fibers entering into and overlapping in said high fiber density areas from at least eight directions;

said high fiber density areas having a randomized orientation and being spaced apart from each other in a uniformly patterned manner by said low fiber density areas, said randomized orientation being caused by said parallelized strands of fibers overlapping in said high fiber density areas from at least eight directions.

4,183,996

COATED CLOSED CELL FOAM ARTICLE

Charles J. Kremer, Brookhaven; Albert C. Condo, Newton Square, both of Pa., and Donald S. Brown, Park Forest, Ill., assignors to Atlantic Richfield Company, Philadelphia, Pa.

Continuation of Ser. No. 390,963, Aug. 23, 1973, abandoned, which is a continuation of Ser. No. 202,680, Nov. 26, 1971, abandoned, which is a continuation of Ser. No. 878,226, Nov. 19, 1969, abandoned. This application Jun. 6, 1977, Ser. No. 803,486
Int. Cl.[2] B32B *3/26, 5/18, 27/00*
U.S. Cl. 428—315 **11 Claims**

1. A polymeric foam with a closed cell structure having coated on at least one side thereof a composition comprising in parts by weight:

(A) 100 parts of a wax having a melting point greater than 120° F.;

(B) from 5 to 70 parts of a polyvinyl alkyl ether having an average molecular weight ranging from about 1,000 to about 15,000; and

(C) in an amount sufficient to impart to the composition a total acid number ranging from 5 to 200, a wax compatible, non-corrosive carboxylic acid, said acid having an acid number in excess of about 20.

4,183,997

BONDING OF SOLID LIGNOCELLULOSIC MATERIAL

John Stofko, Charles, Ill., assignor to John Jansky, Paris, France

Continuation-in-part of Ser. No. 767,261, Feb. 10, 1977, Pat. No. 4,107,379, which is a continuation of Ser. No. 549,663, Feb. 13, 1975, abandoned. This application Oct. 4, 1977, Ser. No. 839,462
Claims priority, application United Kingdom, Feb. 22, 1974, 8084/74; May 8, 1974, 20227/74
Int. Cl.[2] B32B *5/16*
U.S. Cl. 428—326 **30 Claims**

1. A method of bonding solid lignocellulosic materials and thereby producing a waterproof bond, which comprises

providing on a surface of said solid lignocellulosic material an adhesive-free bonding material consisting essentially of at least one sugar, starch or mixture thereof and an amount sufficient to catalyze transformation of the sugar or starch of a catalyst capable of transformation of the sugar or starch to cause waterproof bonding of adjacent lignocellulosic surfaces by means of the intermediate layer of adhesive-free bonding material therebetween, said catalyst being an alkaline salt or a mixture of an alkaline material and an acidic salt so that said bonding material will not decrease the pH after heating of the solid lignocellulosic material to below about 3.5, and

pressing surfaces of the lignocellulosic material together at an elevated temperature and for a time sufficient to effect said bonding by said transformation reactions of the carbohydrate, and wherein the time, temperature and pressure are sufficient to produce a waterproof bond.

16. A method according to claim 1, in which the lignocellulosic material comprises particles of wood.

4,183,998

CRAZE-RESISTANT POLYSILOXANE RESIN COATINGS AND COATING COMPOSITIONS CONTAINING A DISCONTINUOUS PHASE

Eustathios Vassiliou, Newark, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 829,824, Sep. 1, 1977. This application Mar. 31, 1978, Ser. No. 892,300

Int. Cl.[2] **B32B** *5/16, 27/00;* **B05D** *3/02*

U.S. Cl. 428—327 **16 Claims**

1. A coated substrate having a coating consisting essentially of a continuous phase of a cross-linked polysiloxane resin which has dispersed throughout it about 5–30% by weight of a discontinuous particulate phase of a polyamide-imide modifier, based on the combined weight of the resin and the modifier,

wherein the modifier has an average particle size in the range of 0.1–15 μm, the modifier is tougher than the coating, and the modifier has a higher static coefficient of friction against the polysiloxane resin than does polytetrafluoroethylene, and wherein the polysiloxane resin has a degree of elongation not greater than about 4%.

4,183,999

GARNET SINGLE CRYSTAL FILM FOR MAGNETIC BUBBLE DOMAIN DEVICES

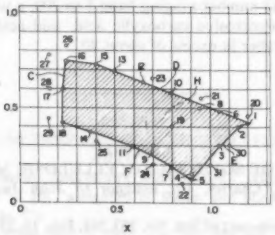
Norio Ota, Kokubunji, and Fumihiko Ishida, Hachioji, both of Japan, assignors to Hitachi, Ltd., Japan

Filed Oct. 3, 1977, Ser. No. 838,873

Claims priority, application Japan, Oct. 8, 1976, 51/120329

Int. Cl.[2] **B01N** *17/00*

U.S. Cl. 428—336 **9 Claims**



1. A garnet single crystal film for magnetic bubble domain devices having a composition represented by the formula

$$R_3(Fe_{3-x}M_x)(Fe_{2-y}M'_y)O_{12}$$

wherein R is at least one member selected from the group consisting of Y, Ca, La, Ce, Pr, Nd, Pm, Sm, Eu, Gd, Tb, Dy, Ho, Er, Tm, Yb and Lu; M is at least one member selected from the group consisting of Ge, Al, Si and Ga; M′ is at least one member selected from the group consisting of Sc, In, Cr, Zr and Sn; and x and y each have a value within the range H in FIG. 2.

4,184,000

COUPLING DEVICE FOR GLASS OR METAL PARTS

Stephen A. Denman, 1216 Cloverfield Ave., Apt. A, Dayton, Ohio 45429

Continuation of Ser. No. 704,327, Jul. 12, 1976, abandoned, and a continuation of Ser. No. 105,554, Jan. 11, 1973, abandoned, which is a continuation of Ser. No. 825,122, May 6, 1969, abandoned, and Ser. No. 536,242, Jan. 18, 1966, abandoned. This application Mar. 23, 1978, Ser. No. 889,373

Int. Cl.[2] **C09J** *7/02;* **B60J** *1/02, 1/20;* **H01Q** *1/32*

U.S. Cl. 428—347 **18 Claims**

1. A coupling device, having special application to creating a bond between metal and glass, including an element physically comprised of stable flexible thermo-plastic material, said element being constituted of materials which in a temperature range including from about 300° to about 500° F. are constructed and arranged to provide said element with an internal or core portion of thermo-plastic material which has a stable load accommodating form and an external portion defining its outermost surface having a fluidly adhesive form.

9. A coupling device, comprising a relatively solid body member of thermo-plastic material having an elongated strip-like form, said member being flexible to provide for a contoured installation thereof on one part to form a bond and a seal between said one part and another superposing part seating on the said body member, said body member being structured and of a composition such that under the influence of a temperature in the range of 300° to 500° F. it includes a relatively stable internal or core portion adapting, but only to the degree necessary, to the contour of an applied load and an external outer surface portion which has a fluidly adhesive form, said body member having an initial cross-sectional outline of one configuration a portion of which is oriented in use

to seat to said one part while the other part abuts an opposite portion, and means within said body member for disseminating heat through the interior thereof and to its outer surface to a level in a range from about 300° to 500° F. under the influence of which only the external portions of said body member achieve a fluid state and said fluid outer surface portions have an adhesive form which serves to provide for a bond of said body member to and between said parts in contact therewith, said body member being adapted under the influence of an applied load to assume a different cross-sectional outline providing opposing faces thereon which achieve a wide sealing and adhering contact with said parts while said body member retains the cross-sectional configuration of a solid by reason of its stable core and said heat disseminating means provides means for re-heating said body member after the cooling and bonding thereof, said body member being constructed and arranged when subjected to re-heating at a level of 300° to 500° F. to reassume a fluidly adhesive form at its outer surface portions only, whereby to facilitate the stripping of said body member from and between said parts.

4,184,001

MULTI LAYER INSULATION SYSTEM FOR CONDUCTORS COMPRISING A FLUORINATED COPOLYMER LAYER WHICH IS RADIATION CROSS-LINKED

Nelson Hildreth, Winooski, Vt., assignor to Haveg Industries, Inc., Marshallton, Del.

Filed Apr. 19, 1978, Ser. No. 897,967

Int. Cl.[2] **B05D** *3/06;* **B32B** *15/02, 15/08, 27/08;* **H01B** *3/30*

U.S. Cl. 428—383 **11 Claims**

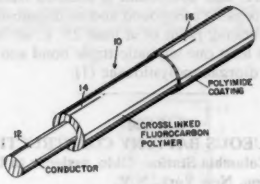
1. An insulation system for electrical conductors comprising a first layer of radiation crosslinked polymeric insulation in which the polymer is selected from ethylene-tetrafluoroethylene copolymer, ethylene-tetrafluoroethylene terpolymer, and ethylene-chlorotrifluoroethylene copolymer, which polymer has been crosslinked solely by subjecting said polymer to high energy ionizing radiation, said radiation dose being from 3 megarads to 20 megarads, and a coating comprising a heat curable polyimide adherent to the surface of the crosslinked polymeric insulation.

7. An insulated electrical conductor comprising

(a) an electrical conductor,

(b) a first layer of crosslinked polymeric insulator surround-

ing the electrical conductor, said polymer being selected from ethylene-tetrafluoroethylene copolymer, ethylene-tetrafluoroethylene terpolymer, and ethylene-chlorotrifluoroethylene, copolymer, said polymer being crosslinked solely by subjecting said polymer to from 3 megarads to 20 megarads of high energy ionizing radiation, and



(c) a heat curable polyimide adherent to the surface of the crosslinked polymeric insulation.

4,184,002

UNDULATED METALLIC ELEMENTS FOR THE REINFORCEMENT OF COMPOSITE MATERIALS

André Reiniche, Clermont-Ferrand, and Philippe Sauvage, Chateaugay, both of France, assignors to Compagnie Generale des Etablissements Michelin, Clermont-Ferrand, France

Filed May 30, 1978, Ser. No. 910,845
Claims priority, application France, Jun. 6, 1977, 77 17481
Int. Cl.[2] B21D *13/00*
U.S. Cl. 428—603 **5 Claims**

1. Filiform elements, particularly of steel, intended for the reinforcement of agglomerates, characterized by the fact that said elements have a nearly rectangular cross-section and are undulated perpendicular to their longitudinal axis and parallel to the largest dimension of their cross-section.

4,184,003

STABLE HECTOGRAPH COMPOSITIONS, TRANSFER ELEMENTS AND PROCESSES

Herbert Knabe, Centereach; Allan T. Schlotzhauer, Glen Cove, both of N.Y., and Michael A. Scott, London, England, assignors to Columbia Ribbon & Carbon Mfg. Co., Inc., Plainview, N.Y.

Filed Apr. 4, 1977, Ser. No. 784,300
Int. Cl.[2] C09D *3/18;* **C09K** *3/00;* **C08L** *1/28*
U.S. Cl. 428—411 **10 Claims**

1. Moisture-stable hectograph composition suitable for coating onto a flexible foundation and drying to form a pressure-transferable dye layer, comprising 1 part by weight of a cellulose ether binder material selected from the group consistng of ethyl cellulose, hydroxyethylcellulose and ethyl hydroxyethyl cellulose, from about 2 to about 4 parts by weight of at least one oleaginous material which is substantially incompatible with said binder material, from about 4 to about 7 parts by weight of particulate, spirit-soluble hectograph imaging material which possesses a moisture content no greater than about 5% based upon the total weight of said imaging material, and a sufficient amount of a volatile vehicle to render said composition coatable, said vehicle being a substantial non-solvent for said imaging material and comprising a miscible mixture comprising from 15% to 35% by weight of an aliphatic ester having from 3 to 6 carbon atoms which is a solvent for said binder material and from 85% to 65% by weight of a volatile liquid diluent which is a substantial non-solvent for said imaging material and for said binder material and has a boiling point which is between about 200° F. and 300° F. and is at least about 30° F. above the boiling point of said aliphatic ester.

7. Process for producing a pressure-sensitive hectograph transfer element comprising the steps of

(a) producing a moisture-stable hectograph coating composition by mixing together 1 part by weight of a cellulose ether binder material, from about 2 to 4 parts by weight of at least one oleaginous material which is substantially incompatible with said binder material, from about 4 to 7 parts by weight of particulate, spirit-soluble hectograph imaging material which possesses a moisture content no greater than about 5% based upon the total weight of said imaging material, and a sufficient amount of a volatile vehicle to render said composition coatable, said vehicle being a substantial non-solvent for said imaging material and comprising a miscible mixture comprising from 15% to 35% by weight of an aliphatic ester having from 3 to 6 carbon atoms which is a solvent for said binder material, and from 85% to 65% by weight of a volatile liquid diluent which is a substantial non-solvent for said imaging material and for said binder material and has a boiling point which is between about 200° F. and 300° F. and is at least about 30° F. above the point of said aliphatic ester.

(b) applying said composition as a uniform thin layer over a flexible foundation, and

(c) solidifying said layer by first evaporating said aliphatic ester and then evaporating said volatile liquid diluent to form a dry, pressure-transferable hectograph layer on said foundation.

4,184,004

TREATMENT OF TEXTILE FABRICS WITH EPOXY-POLYOXYALKYLENE MODIFIED ORGANOSILICONES

Arthur N. Pines, Katonah; Gordon C. Johnson, Armonk, and Fannie L. Campbell, Briarcliff Manor, all of N.Y., assignors to Union Carbide Corporation, New York, N.Y.

Filed Apr. 21, 1978, Ser. No. 899,103
Int. Cl.[2] C08G *47/04;* **D06M** *15/66*
U.S. Cl. 428—413 **28 Claims**

1. A process for imparting a durable, soft, hydrophilic finish to a textile material which comprises:

(A) applying to said textile material, in an amount sufficient to improve the softness thereof, an organosilicone terpolymer of the formula

$$MD_xD_y'D''_zM$$

wherein M, in each occurrence, is an end-capping unit of the formula $A_3SiO_{\frac{1}{2}}$ in which A is a monovalent organic radical free of olefinic unsaturation or hydroxyl bonded directly to the silicon atom, or M is alkoxy of 1 to 13 carbon atoms; D is a unit of the formula R_2SiO wherein R is a monovalent hydrocarbon radical free of acetylenic unsaturation; D' is a unit of the formula RR'SiO wherein R is a monovalent hydrocarbon radical free of acetylenic unsaturation and R' is a polyoxyalkylene unit of the formula

$$-C_nH_{2n}(OC_2H_4)_a(OC_3H_6)_bOR''$$

in which R'' is hydrogen, acyl of 1 to 8 carbon atoms or a monovalent hydrocarbon radical from 1 to 13 carbon atoms, n is an integer having an average value from 1 to 8, and a and b are integers such that the sum of a+b is from 5 to 200 and the quantity a÷(a+b) is from 1.0 to 0; D'' is a unit of the formula RR'''SiO wherein R is a monovalent hydrocarbon radical free

of acetylenic unsaturation and R''' is a monovalent organic radical containing at least one vicinal epoxy group; x is an integer having an average value of from 10 to 5,000; y is an integer having an average value from 1 to x; and z is an integer having an average value of from 1 to 0.5x; provided that the sum y+z is not greater than 0.75x; and

(B) curing the organosilicone terpolymer on the textile fabric.

15. A textile material having improved durable softness and water absorbancy which is produced by the process of claim 1.

4,184,005

PROCESS OF SOLVENT-FREE LAMINATION USING ISOCYANATE/AMINE ADHESIVES

Hans Bauriedel, Dusseldorf, and Rainer Hasenkamp, Erkrath, both of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien (Henkel KGaA), Dusseldorf-Holthausen, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 738,439, Nov. 13, 1976. This application Apr. 20, 1978, Ser. No. 898,023

Claims priority, application Fed. Rep. of Germany, Nov. 4, 1975, 2549371; Apr. 27, 1977, 2718615

Int. Cl.[2] B32B *7/04, 31/06*

U.S. Cl. 428—420 **16 Claims**

1. A method for the production of laminated films employing a two-component non-solvent adhesive system, which comprises the steps of

applying a thin film of a mixture of (a) the reaction product of 1 mole of polyoxyalkylene glycol having 2 to 4 carbon atoms in the alkylene and 2 moles of a diisocyanate, said reaction product having a molecular weight of from 2000 to 5000, and (b) a compound selected from the group consisting of (i) the reaction product of an alkanepolyol having 3 to 10 carbon atoms and 3 to 6 hydroxyl groups or a cycloalkane polyol having 6 to 8 carbon atoms and 3 to 6 hydroxy groups with a diisocyanate, wherein 1 mole of diisocyanate is reacted per hydroxy group of said polyol; (ii) the reaction product of one mole of water and three moles of a diisocyanate; (iii) an aromatic triisocyanate; and (iv) a polyisocyanate, said compound (b) having at least three isocyanate groups being present in an amount of 0.5 to 20% by weight, relative to said reaction product (a), to one of two films to be bonded together,

applying to the other film to be bonded a thin film of at least one second reaction product of 1 mole of polyoxyalkylene glycol having 2 to 4 carbon atoms in the alkylene with 2 moles of acrylonitrile, which was subsequently catalytically hydrogenated, said reaction product having a molecular weight of from 300 to 2000, the application of both thin films being in such amounts that the molar ratio of isocyanate groups to amine groups is from 1:1 to 5:1 and the two components together being present in an amount of 0.5 to 5.0 gm/m^2,

pressing the coated sides of the two coated films together whereby adhesion between the coated films is initiated, and

recovering said laminated films.

4,184,006

PROCESS FOR PREPARING ADHESIVE REPELLENT COATINGS AND COATED ARTICLE

Friedrich Hockemeyer, Emmerting, and Peter August, Burghausen, both of Fed. Rep. of Germany, assignors to Wacker-Chemie GmbH, Munich, Fed. Rep. of Germany

Filed Nov. 14, 1977, Ser. No. 851,036

Claims priority, application Fed. Rep. of Germany, Dec. 3, 1976, 2654893

Int. Cl.[2] B32B *9/04*

U.S. Cl. 428—447 **8 Claims**

1. A process for the preparation of adhesive repellent coatings which comprises applying to a surface to be rendered adhesive repellent a mixture consisting essentially of (1) a diorganopolysiloxane having terminal Si-bonded vinyl groups, but is otherwise free of aliphatic multiple bonds, (2) an organopolysiloxane having at least 3 Si-bonded hydrogen atoms per molecule, (3) a vinylsiloxane platinum complex which is essentially free of halogen, and (4) a compound which retards the addition of Si-bonded hydrogen to aliphatic multiple bonds at room temperature, said compound is selected from the class consisting of an organic compound and an organosilicon compound having a boiling point of at least 25° C. at 760 mm Hg (absolute) and at least one aliphatic triple bond and thereafter crosslinking the diorganopolysiloxane (1).

4,184,007

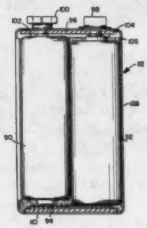
NONAQUEOUS BATTERY CONSTRUCTION

Lewis F. Urry, Columbia Station, Ohio, assignor to Union Carbide Corporation, New York, N.Y.

Filed Dec. 15, 1978, Ser. No. 969,878

Int. Cl.[2] H01M *14/00*

U.S. Cl. 429—8 **13 Claims**



1. A battery comprising an outer container having an opening at the top and a closed base member; disposed within said container at least two nonaqueous cells employing an electrolyte solution containing at least a liquid selected from the group consisting of an oxyhalide, a halide, liquid sulfur dioxide and mixtures thereof, said cells electrically connected in predetermined electrical relation so as to provide two electrode terminals for a cell assembly disposed at the open end of the container; a terminal board having two external terminals exposed on its surface and being secured to the open end of the container, each of said external terminals being electronically connected to one of the two electrode terminals of the cell assembly; and a resilient material disposed within the container between the cells and at least a portion of an inner wall of the container, said resilient material containing an immobilizing chemical agent that will substantially react with and neutralize any of the oxyhalide, halide, liquid sulfur dioxide, mixtures thereof or their reaction products that escape from any of the cells.

4,184,008

FLOAT TYPE METAL-AIR BATTERY

Yuichi Watakabe, Tennocho-danchi 2-1220, No. 42-2, 2-chome, Tenno-cho, Hodogaya-ku, Yokohama-shi, Kanagawa-ken, Japan

Filed Mar. 29, 1978, Ser. No. 891,332

Claims priority, application Japan, Apr. 4, 1977, 52/40953[U]

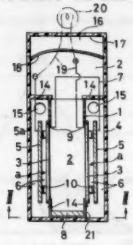
Int. Cl.[2] H01M *6/34, 12/06*

U.S. Cl. 429—27 **5 Claims**

1. A float type metal-air battery comprising:

a box-like outer frame unit having pairs of opposed side walls, a top wall, an open bottom, and an interior partition wall disposed in spaced parallel relation to the top wall to define an upper air chamber therebetween, said partition wall having a central opening, a box-like inner frame unit having pairs of opposed side walls, a bottom wall and an open top, said inner frame unit interiorly defining a central air chamber, means for removably supporting said inner frame unit within said outer frame unit with said central opening aligned with said open top and with correspond-

ing opposed side walls of the inner and outer frame units in spaced-apart relation to define water chamber regions therebetween, electrolyte cell means including anode and cathode plates disposed in said water chamber regions, a pair of opposed side walls of the inner frame unit each having an opening with one of said plates sealed air and liquid tightly therein in window-like fashion, means supporting the other of said plates in spaced parallel relation therewith, and



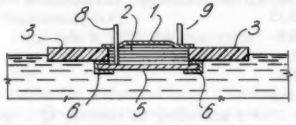
bottom cover means for said outer frame unit to enclose the inner frame unit therein, at least some of the walls of said outer frame unit having openings below said partition wall for enabling circulatory flow of water to said water chamber regions, and having openings above said partition for enabling circulatory flow of air to the air chambers.

4,184,009

BUOYANT METAL/AIR BATTERY

William A. Armstrong, Ottawa, Canada, assignor to Her Majesty the Queen in right of Canada, as represented by the Minister of National Defence, Ottawa, Canada

Filed Nov. 15, 1978, Ser. No. 961,015
Claims priority, application Canada, Dec. 13, 1977, 292984
Int. Cl.[2] H01M *12/06*
U.S. Cl. 429—27 **19 Claims**



1. A floating metal/air battery, comprising
(a) a metal anode,
(b) an air cathode,
(c) means for completing an electro-conductive path from the anode to the cathode, and
(d) floatation means, such that in use the metal anode is immersed in a suitable electrolyte and wherein the completing means is in contact with the electrolyte.

4,184,010

METHOD FOR PREVENTING EXPLOSION IN THIONYL CHLORIDE DEPOLARIZER CELLS

Arabinda N. Dey, Needham, and James H. Him, 28 Carey Ave., Burlington, both of Mass., assignors to P. R. Mallory & Co. Inc., Indianapolis, Ind.

Continuation-in-part of Ser. No. 865,149, Dec. 28, 1977, Pat. No. 4,115,629, which is a continuation-in-part of Ser. No. 700,421, Jun. 28, 1976, abandoned. This application Feb. 3, 1978, Ser. No. 875,054
Int. Cl.[2] H01M *2/12*
U.S. Cl. 429—50 **4 Claims**

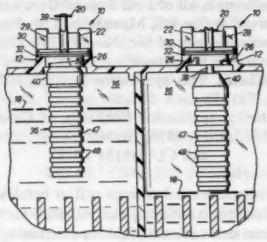
1. A method for preventing chemical explosion of an electrochemical cell containing thionyl chloride comprising the step of relieving the pressure in said cell before said pressure exceeds 350 p.s.i.g.

4,184,011

BATTERY REFILL INDICATOR

Edward R. Strazewski, c/o Electro-Hite Co., P.O. Box 187, Cedarburg, Wis. 53012

Filed May 8, 1978, Ser. No. 903,757
Int. Cl.[2] H01M *10/48*; G01F *23/00*
U.S. Cl. 429—91 **6 Claims**



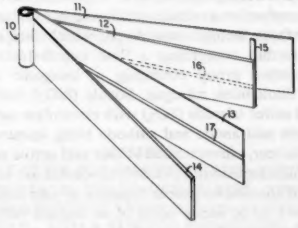
1. A battery refill comprising:
a cap,
a liquid level indicator supported by said cap, said indicator including means extending above said cap to indicate the proper level of electrolyte in the battery and means responding to the level of the electrolyte in the battery, said cap includes a base portion having a splash guard in the form of a flat washer mounted in the lower portion thereof for controlling the motion of the indicating means whereby the height of the indicating means above the cap indicates whether the proper level of electrolyte is present in the battery.

4,184,012

CELL REACTION BARRIER

Joseph N. Barrella, Irvington, N.Y., assignor to P. R. Mallory & Co. Inc., Indianapolis, Ind.

Filed Jun. 5, 1978, Ser. No. 912,611
Int. Cl.[2] H01M *6/00*
U.S. Cl. 429—94 **25 Claims**



1. An electrochemical cell comprising a consumable electrode, a terminal for said electrode, said terminal and said consumable electrode being discrete elements, and an electrode of opposite polarity, said consumable electrode being connected to said terminal, said cell further comprising means to prevent electrical disengagement from said terminal of remote portions of said consumable electrode, wherein said means to prevent electrical disengagement retards reaction of a continuous portion of said consumable electrode from adjacent said terminal to a locus adjacent said remote portions, whereby said remote portions of said consumable electrode

remain electrically connected to said terminal throughout discharge of said cell so that electrical continuity between said consumable electrode and said terminal is maintained.

4,184,013

ELECTROCHEMICAL STORAGE CELL

Gert Weddigen, Heidelberg-Neuenheim; Wilfried Fischer, Neckargemund; Herbert Kleinschmager, Eppelheim, and Wilhelm Haar, Sandhausen, all of Fed. Rep. of Germany, assignors to Brown, Boveri & Cie AG, Mannheim, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 947,734, Oct. 2, 1978, abandoned, which is a continuation of Ser. No. 817,378, Jul. 20, 1977, abandoned. This application Dec. 22, 1978, Ser. No. 972,285

Claims priority, application Fed. Rep. of Germany, Jul. 24, 1976, 2633455; Jul. 24, 1976, 2633456

Int. Cl.[2] H01M *10/39*

U.S. Cl. 429—104 **23 Claims**

1. In an electrochemical storage cell or battery with at least one anode chamber containing molten alkali metal as the anolyte and at least one cathode chamber containing a sulfur-containing catholyte substance, with the anode chamber and the cathode chamber separated from each other by an alkali-ion-conducting solid electrolyte, the improvement which comprises addition of an additive to the catholyte substance, which additive converts sulfur chains in the catholyte substance into an electrically charged state for obtaining electromigration of the sulfur, wherein the additive is an organic dienophilic compound.

4,184,014

ABUSE RESISTANT CELLS CONTAINING FLUID DEPOLARIZERS

Arabinda N. Dey, Needham, Mass., assignor to P. R. Mallory & Co. Inc., Indianapolis, Ind.

Filed Nov. 24, 1978, Ser. No. 963,657

Int. Cl.[2] H01M *4/36*

U.S. Cl. 429—105 **11 Claims**

1. An abuse resistant electrochemical cell comprising an active metal anode selected from the group consisting of lithium, sodium, potassium, berylium, magnesium, calcium, and aluminum electrically connected to a terminal therefor, and an inactive conductive cathode, with said anode and cathode having surfaces thereof respectively which face each other, said cell further comprising a fluid depolarizer/electrolyte solvent selected group consisting of inorganic oxyhalides, inorganic thiohalides, nitrogen dioxide (NO_2), sulfur dioxide (SO_2), and sulfur trioxide (SO_3) with electrolyte salt dissolved therein with said anode and cathode being immersed in said fluid depolarizer, characterized in that said active metal anode and said fluid depolarizer/electrolyte solvent are each present in excess of the dischargeable capacity of said cell, with said excess active metal anode being of an amount sufficient such that a surface thereof remains substantially facing said initially facing surface of said cathode, with said excess active metal anode remaining electrically connected to said terminal; and said excess fluid depolarizer/electrolyte solvent being of an amount sufficient to substantially wet said excess anode and said cathode, whereby current may be conducted therethrough without heat concentration within said cell, and wherein said excess fluid depolarizer/electrolyte solvent contains sufficient electrolyte salt dissolved therein whereby said fluid depolarizer, with dissolved salt, retains a conductivity sufficiently high such that current may be carried therethrough without resistance heat buildup.

4,184,015

AMORPHOUS CATIONIC CONDUCTORS

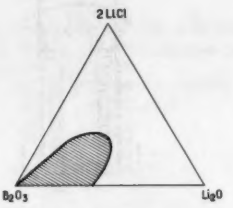
Jean-Maurice Reau, Floirac; Alain Levasseur; Claude Fouassier, both of Gradignan; Bernard Cales, Orleans, and Paul Hagenmuller, Valence, all of France, assignors to Compagnie Generale d'Electricite S.A., Paris, France

Filed Apr. 17, 1978, Ser. No. 896,527

Claims priority, application France, Apr. 15, 1977, 77 11376

Int. Cl.[2] H01B *1/06*

U.S. Cl. 429—193 **16 Claims**



14. Electric cells which include an anode based on lithium, a cathode mode of a material with a host structure for lithium and an amorphous cationic conductor of lithium comprising a composition corresponding to the general formula:

$$\{B_2O_3, xM, yN\}, aLi_2O, bLi_2Q$$

in which:

M is chosen from the group formed by:

Al_2O_3, V_2O_5, P_2O_5, As_2O_5 and As_2O_3;

N is chosen from the group formed by:

SiO_2 and GeO_2;

Q is chosen from the group consisting of; F^-, Cl^-, Br^-, S^{2-}, SO_4^{2-}, MoO_4^{2-}, N^{3-}, PO_4^{3-} and WO_4^{2-}

$0 \leqq x \leqq 0.35$

$0 \leqq y \leqq 0.8$

$0 < a \leqq 2$

$0 < b < 1.5$

$b \leqq 2a$; and

$z = 1$ or 2 or 3 according to whether Q is mono-, bi- or tri-valent.

4,184,016

DOUBLE CHROMATE COMPOSITION FOR USE AS A POSITIVE ACTIVE MATERIAL IN BATTERIES AND BATTERY

Andre Lecerf, Pace, France, assignor to Saft-Societe des Accumulateurs Fixes et de Traction, Romainville, France

Filed Oct. 17, 1978, Ser. No. 952,089

Claims priority, application France, Oct. 18, 1977, 77 31272

Int. Cl.[2] H01M *6/14*

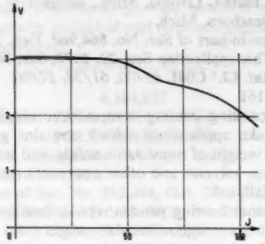
U.S. Cl. 429—194 **6 Claims**

1. A composition having the general formula:

$$MM'(CrO_4)_2$$

wherein M and M′ represent silver and bismuth, respectively.

2. A nonaqueous electrolyte battery comprising a lithium negative electrode and wherein the positive active material



comprises a double chromate of silver and bismuth, $AgBi(CrO_4)_2$.

4,184,017

POLYVALENT METAL ANODE CONTAINING CELLS

G. Stephen Kelsey, Tyngsboro; Arabinda N. Dey, Needham, and Per Bro, Andover, all of Mass., assignors to P. R. Mallory & Co. Inc., Indianapolis, Ind.

Filed Jan. 24, 1979, Ser. No. 6,051
Int. Cl.[2] H01M 6/16
U.S. Cl. 429—197 10 Claims

1. An electrochemical cell comprising an anode comprised of a polyvalent film forming metal above hydrogen in the EMF series, an electrolyte salt, a non-aqueous nucleophilic electrolyte solvent and a carbon halide compound within said solvent and providing a solution of not more than 1 molar therewith.

4,184,018

NON-FLASHING ELECTROLYTE FOR USE WITH CALCIUM ANODE

Aaron N. Fletcher, Ridgecrest; Charles D. Stanifer, Hesperia, and Dan E. Bliss, Ridgecrest, all of Calif., assignors to The United States of America as respresented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 5, 1979, Ser. No. 8,998
Int. Cl.[2] H01M 6/04
U.S. Cl. 429—199 1 Claim

1. An electrolyte for a thermal battery having a calcium anode, consisting of a mixture in which the positive ions are 20 to 30 mole percent K^+ and the remainder Li^+ and in which the negative ions are about 87.5 mole percent nitrate and the remainder chloride.

4,184,019

OXIDATIVELY STABLE ION EXCHANGE RESIN CONDENSATION PRODUCT OF AN EPICHLOROHYDRIN AND A POLYAMINE

Thomas E. Meteyer, Ambler, and William Fries, Southhampton, both of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Filed Apr. 20, 1978, Ser. No. 897,989
Int. Cl.[2] C08G 73/02, 2/30; B01D 15/04
U.S. Cl. 521—34 9 Claims

1. A weakly basic ion exchange resin comprising a polymer containing secondary hydroxyl groups, said polymer being a condensation product of an epihalohydrin and a polyamine, which polymer contains tertiary amine groups resulting from the reaction of said condensation product with formaldehyde and thereafter with formic acid, said polyamine having the general formula:

$$H_2N[(CH_2)_b—(N)_e—(CH_2)_c]_d—(CH_2)_f—NH_2$$

wherein b is a number from 0 to 16, c is a number from 0 to 16, the sum of b plus c being 0 to 16, d is from 0 to 5, the sum of b plus c plus d being from 0 to 14, f is from 2 to 3, e is from 0 to 1, and when b is 0, e is 0 said polyamine having a molecular weight of from about 60 to about 298.

4,184,020

PREPARATION OF HYDROPHILIC MATERIAL FOR GEL CHROMATOGRAPHY

Drahoslav Lim; Jiri Coupek; Miroslava Krivakova, and Svatopluk Pokorny, all of Prague, Czechoslovakia, assignors to Ceskoslovenska akademie ved, Prague, Czechoslovakia

Continuation of Ser. No. 281,288, Aug. 17, 1972, abandoned, which is a continuation-in-part of Ser. No. 201,311, Nov. 23, 1971, abandoned. This application Aug. 19, 1977, Ser. No. 825,922
Claims priority, application Czechoslovakia, Nov. 24, 1970, 7919-70
Int. Cl.[2] C08F 220/20
U.S. Cl. 521—52 9 Claims

1. A method for preparing insoluble globular hydrophilic copolymers of macroreticulated internal structure comprising suspension polymerizing a mixture of

(a) a hydroxylalkyl methacrylate, and

(b) a hydrophobic monomer selected from the group consisting of ethylene dimethacrylate and ethylene diacrylate,

the hydroxyalkyl methacylate being present in amount of at least 70% by weight of said mixture, in an aqueous medium in the presence of a polymerization initiator and in the presence of

(1) a first inert organic compound selected from the group consisting of cyclohexanol and cyclohexylamine, and

(2) a second inert organic compound selected from the group consisting of dodecyl alcohol, n-octyl alcohol, decyl alcohol, dibutyl ether, hexadecyl alcohol, n-hexadecyl acetate and dodecyl amine, said first inert compound being soluble in the monomer mixture and insoluble in water, the value of the partition coefficient of the hydrophobic monomer between water and said first inert compound being limited to substantially zero, thus preventing extraction of the hydrophilic monomer into the aqueous phase, the second inert compound being insoluble in water, soluble in the monomer and being a precipitant for the copolymer, the inert organic compounds (1) and (2) being present in weight amount of from about 17.32% to about 18.36% of the weight of water present in said aqueous medium, the weight ratio between the compound (1) and the compound (2) being in the range of about 2.32:1 to 2.82:1.

4,184,021

AMBIENT CURE POLYIMIDE FOAMS PREPARED FROM AROMATIC POLYISOCYANATES, AROMATIC POLYCARBOXYLIC COMPOUNDS, FURFURYL ALCOHOL, AND A STRONG INORGANIC ACID

Robert A. Frosch, Administrator of the National Aeronautics and Space Administration, with respect to an invention of; Paul M. Sawko; Salvatore R. Riccitiello, both of San Jose, Calif., and Charles L. Hamermesh, Westlake Village, Calif.

Filed Oct. 31, 1978, Ser. No. 956,161
Int. Cl.[2] C08G 18/14
U.S. Cl. 521—106 5 Claims

1. In a process for the preparation of a high temperature resistant foam by reaction of an aromatic polyisocyanate and an aromatic polycarboxylic compound, the improvement comprising carrying out the reaction in the presence of furfuryl alcohol and a strong inorganic acid.

4,184,022

POLYISOCYANURATE FOAM COMPRISING REACTION PRODUCT OF A POLYISOCYANATE AND A POLYOL MIXTURE COMPRISING A CARBOXYLIC ESTER POLYOL AND A RESOLE POLYETHER POLYOL USING A CATALYST COMPRISING DIMETHYLETHANOLAMINE AND AN ALKALI METAL SALT OF A CARBOXYLIC ACID

Russell R. Lawyer, Newark, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Sep. 15, 1978, Ser. No. 942,662
Int. Cl.[2] C08G *18/14*
U.S. Cl. 521—118 **14 Claims**

1. A rigid cellular urethane-modified polyisocyanurate foam product comprising the reaction product of polynuclear aromatic polyisocyanate material and polyol material; said polyol comprising a biphenyl di and tri carboxylic acid ester of a low molecular weight alkanediol and a resole-type polyether polyol; said polyisocyanate material being present in sufficient amount to provide isocyanurate groups as the major recurring polymer unit; a catalytic amount of a binary catalyst comprising dimethyl ethanolamine and an alkali metal salt of carboxylic acid; a halocarbon blowing agent; a cell modifier; and a flame retardant material; said foam having low flame spread rate and low smoke evolution.

4,184,023

USE OF METHACRYLAMIDE DERIVATIVE AS POLYURETHANE CATALYST

Michael Cuscurida, Austin, Tex., assignor to Texaco Development Corp., White Plains, N.Y.

Filed Oct. 10, 1978, Ser. No. 949,708
Int. Cl.[2] C08G *18/18*
U.S. Cl. 521—129 **3 Claims**

1. A method for producing a polyurethane which comprises reacting an organic polyisocyanate with an organic polyester polyol or polyether polyol in the presence of a catalytic amount of N-(dimethylaminopropyl) methacrylamide.

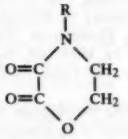
4,184,024

POLYURETHANES PREPARED FROM POLYOLS FROM 2,3-MORPHOLINEDIONES

Howard P. Klein, Houston, Tex., assignor to Texaco Development Corp., White Plains, N.Y.

Division of Ser. No. 830,724, Sep. 6, 1977, Pat. No. 4,118,422, which is a continuation-in-part of Ser. No. 716,610, Aug. 23, 1976, abandoned. This application Jun. 12, 1978, Ser. No. 915,043
Int. Cl.[2] C08G *18/14, 18/50*
U.S. Cl. 521—167 **4 Claims**

1. A polymer containing recurring urethane linkages, which polymer comprises the reaction product of an aromatic polyisocyanate and a polyol comprising the reaction product of a 2,3-morpholinedione and a polyoxypropylene polyamine, said morpholinedione reactant having the following structural formula:



where R is selected from the group consisting of alkyl, cyanoalkyl, alkanol, phenyl and substituted phenyl.

4,184,025

HIGH SOLIDS COATING COMPOSITION ADAPTED FOR USE AS AUTOMOTIVE TOPCOAT-#3

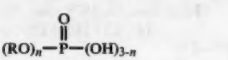
Mohinder S. Chattha, Livonia, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Continuation-in-part of Ser. No. 864,960, Dec. 27, 1977, abandoned. This application Sep. 22, 1978, Ser. No. 945,028
Int. Cl.[2] C08L *63/00, 61/28, 37/00*
U.S. Cl. 525—161 **20 Claims**

1. A thermosetting coating composition adapted for low temperature bake applications which contains greater than about 60% by weight of nonvolatile solids, and which, exclusive of pigments, solvents and other nonreactive components, consists essentially of:

(A) a copolymer bearing pendant epoxy functionality, having a number average molecular weight (M_n) of between about 1500 and about 10,000 and a glass transition temperature (Tg) of between about −25° C. and about 70° C., said copolymer consisting of between about 10 and about 30 weight percent of monoethylenically unsaturated monomers bearing glycidyl functionality and between about 90 and about 70 weight percent of other monoethylenically unsaturated monomers;

(B) a reactive catalyst comprising at least one hydroxy functional organophosphate ester having the formula:



wherein n=1 to 2 and R is selected from the group consisting of mono- or dihydroxy alkyl, cycloalkyl, or aryl radicals;

(C) an amine-aldehyde crosslinking agent; and

(D) up to 45 weight percent based on the total weight of (A), (B), (C), and (D) of a hydroxy functional additive having a number average molecular weight (M_n) of between 150 and about 6000, said hydroxy functional organophosphate ester being included in said composition in an amount sufficient to provide between about 0.67 and about 1.4 equivalents of acid functionality for each equivalent of pendant epoxy functionality on said copolymer, and said amine-aldehyde crosslinking agent being included in said composition in an amount sufficient to provide at least about 0.4 equivalents of nitrogen crosslinking functionality for each equivalent of hydroxy functionality included in said composition either as (i) an organic hydroxyl group on said organophosphate ester, (ii) a hydroxyl group on said hydroxy functional additive, or (iii) as a result of esterification of said pendant epoxy functionality of said copolymer during cure of said coating composition.

4,184,026

METHOD FOR INCORPORATING NUCLEATING AGENTS IN PROPYLENE POLYMERS

Frederick E. Carrock, Paramus, N.J., and Mahendra T. Thakker, Odessa, Tex., assignors to Dart Industries Inc., Los Angeles, Calif.

Filed Dec. 18, 1978, Ser. No. 970,425
Int. Cl.[2] C08F *6/00*
U.S. Cl. 525—4 **16 Claims**

1. A process for uniformly incorporating a minor amount of a nucleating agent in a highly crystalline polymer of propylene which has a lower melting point than said agent comprising dissolving said nucleating agent at a concentration of less than about 10% by weight in carrier liquid having a normal boiling point of not over 120° C. and insignificant solvating action toward said polymer below 120° C., atomizing the resultant solution into a uniform and symmetrical, full jet spray of fine droplets averaging less than about 2 millimeters in diameter and directing said spray with full and even coverage onto a loose pulverulent bed of said polymer in the form of fluffy powder particles predominantly smaller than about 0.25 milli-

meter in equivalent spherical diameter while agitating said bed to expose essentially all portions thereof to direct contact with said spray at some point during the atomizing of a sufficient quantity of said solution to provide between about 50 and about 5000 parts by weight of said nucleating agent per million parts of said polymer.

4,184,027
RECYCLE CONTROL SYSTEM FOR CONTINUOUS POLYMERIZATION

Byrd Hopkins, Longmeadow, Mass., assignor to Monsanto Company, St. Louis, Mo.

Continuation of Ser. No. 192,244, Oct. 26, 1971, abandoned. This application Mar. 18, 1974, Ser. No. 452,303

Int. Cl.[2] C08F *2/00*

U.S. Cl. 526—60 **3 Claims**

1. A method for controlling material balance and weight fraction of polymer in a continuous polymerization reaction producing a mixture of unreacted material and polymer having (a) a variable fillage horizontal continuously stirred and reflux cooled reaction zone wherein monomer is polymerized to polymer, (b) a separation zone in which unreacted material is separated from polymer, and (c) a flow regulating means therebetween, the feed rate of monomer to said reaction zone being maintained at a prechosen constant value, and the effluent rate from said reaction zone being regulated to control the flow rate of unreacted material from said separation zone at a prechosen constant value, so that the total weight of unreacted material and polymer in said reaction zone automatically tends toward a steady value at which the weight fraction of polymer in said reaction zone will be determined by the following relationship:

$$\text{Weight fraction polymer} = \frac{\text{monomer feed flow rate}}{\text{monomer feed flow rate} + \text{unreacted material flow rate}}$$

said method comprising the steps of:

(A) feeding continuously and at a constant prechosen rate monomers to said reaction zone,

(B) removing through said flow regulating means a mixture of unreacted material and polymer from said polymerization zone and feeding such mixture to said separation zone,

(C) separating in said separation zone at least a predetermined weight percentage of said unreacted material from said polymer,

(D) measuring the flow rate of unreacted material so separated in said separation zone and generating a signal representative of said flow rate,

(E) comparing said flow rate signal with a prechosen set signal to produce a control signal, and

(F) feeding said control signal to said flow regulating means to regulate the flow rate of said mixture so removed from said reaction zone, thereby to achieve the desired control of said material balance and said weight fraction of polymer in said reaction zone.

4,184,028
OLEFIN POLYMERIZATION CATALYST

Louis J. Rekers, Wyoming; Stanley J. Katzen, and Jerome H. Krekeler, both of Cincinnati, all of Ohio, assignors to National Petro Chemicals Corporation, New York, N.Y.

Division of Ser. No. 724,484, Sep. 20, 1976, which is a continuation-in-part of Ser. No. 558,504, Mar. 14, 1975, Pat. No. 3,984,351. This application Jun. 29, 1977, Ser. No. 811,003

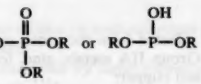
Int. Cl.[2] C08F *4/24, 4/62, 10/00*

U.S. Cl. 526—105 **7 Claims**

1. A process for the polymerization of 1-olefins comprising providing at least one 1-olefin to an enclosed polymerization zone maintained at elevated temperature and pressure and comprising an olefin polymerization catalyst system consisting essentially of:

(a) a solid inorganic support material having surface hydroxyl groups,

(b) an organophosphoryl chromium reaction product of chromium trioxide and a phosphorus compound having the formula:



wherein R is alkyl, aralkyl, aryl, cycloalkyl or hydrogen, but at least one R is other than hydrogen, said reaction product being deposited on said support

(c) an aluminum compound deposited on said support, said aluminum compound being capable of reacting with said surface hydroxyl groups, said supported chromium containing compound and aluminum compound having been heated in a non-reducing atmosphere at a temperature above 300° C. up to the decomposition temperature of the support material.

4,184,029
PROCESS FOR THE PRODUCTION OF HIGH-DUROMETER POLYMERS OF VINYL CHLORIDE WITH PH CONTROL

Josef Kalka, Herten, and Hermann Winter, Marl, both of Fed. Rep. of Germany, assignors to Chemische Werke Huls Aktiengesellschaft, Marl, Fed. Rep. of Germany

Filed Sep. 16, 1976, Ser. No. 724,002

Claims priority, application Fed. Rep. of Germany, Oct. 1, 1975, 2543823

The portion of the term of this patent subsequent to Jan. 9, 1996, has been disclaimed.

Int. Cl.[2] C08F *6/14*

U.S. Cl. 526—216 **12 Claims**

1. In a process for the production of an emulsifier-containing high-durometer particulate polymer of vinyl chloride, at least 90% by weight of which has a particle diameter greater than 63μ, by polymerization of vinyl chloride or a monomer mixture of vinyl chloride and a monomer copolymerizable therewith, in an aqueous emulsion containing at least 45% by weight of monomers in the presence of a water-soluble catalyst and one or more sodium or potassium salts of fatty acids of 8–18 carbon atoms as emulsifier, at pH 9.5–11.5 to a conversion of at least 80%, and by spray-drying a thus-obtained latex, the improvement wherein the pH of the emulsifier-containing high-durometer polymer latex is reduced from 9.5–11 to 6.0–8.0 simultaneously with the spray-drying step to produce said particulate polymer of vinyl chloride, at least 90% by weight of which has a particle diameter greater than 63 microns.

4,184,030
PROCESS AND COMPOSITION FOR POLYMERIZING AND CURING METHYL METHACRYLATE MONOMER-POLYMER SYRUPS IN THE PRESENCE OF METAL SALTS OF HEMI-PERESTERS OF MALEIC ACID

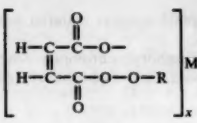
Ronald S. Dudinyak, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 676,801, Apr. 14, 1976, abandoned, which is a continuation-in-part of Ser. No. 615,722, Sep. 22, 1975, abandoned. This application May 25, 1978, Ser. No. 909,558

Int. Cl.[2] C08L *67/02*

U.S. Cl. 525—248 **7 Claims**

1. An improved mixture for preparing polymeric articles consisting of a syrup containing 1–40% by weight of a polymer substantially dissolved in an ethylenically unsaturated monomer or mixtures thereof, and a small amount of a metal salt of a hemi-perester of maleic acid having the formula



wherein

Me is a metal selected from the group consisting of Group IA metals, Group IIA metals, zinc, lead, cobalt, nickel, manganese and copper;

x is an integer having a value of from 1 to the valence of the metal; and

R is a saturated tertiary alkyl radical

wherein the improvement comprises the presence of a salt of an oxo acid of sulfur activator selected from the group consisting of bisulfite, metabisulfite and thiosulfate salts or the free acid and the presence of a polar liquid.

4,184,031

CONTROL OF CURE RATE OF POLYURETHANE RESINS

William H. Graham, and Inella G. Shepard, both of Huntsville, Ala., assignors to Thiokol Corporation, Newtown, Pa.

Division of Ser. No. 740,994, Nov. 11, 1976, Pat. No. 4,110,135. This application Oct. 11, 1977, Ser. No. 841,221

Int. Cl.[2] C08G *18/26, 18/22, 18/24, 18/62*

U.S. Cl. 528—55 **9 Claims**

1. A curable composition comprising a hydroxy terminated polybutadiene, a polyisocyanate and an effective amount of a cure catalyst therefor, said catalyst comprising a metallo organic compound of the formula MR_m where M is an m-valent metal selected from bismuth, lead, tin, arsenic, zinc, copper, cadmium or potassium and R is phenyl, tolyl, benzyl, naphthyl, alkyl of 1 to 20 carbon atoms or cycloalkyl of 5 to 20 carbon atoms and a carboxylic acid or a compound convertible to a carboxylic acid by reaction with Zerewitinoff active hydrogen.

4,184,032

CONTROL OF PROCEDURES FOR FORMATION OF WATER-IMMISCIBLE THERMOSETTING PHENOL-FORMALDEHYDE RESINS

Ramesh C. Vasishth, Delta, Canada, assignor to Cor Tech Research Ltd., Richmond, Canada

Division of Ser. No. 779,621, Mar. 21, 1977, Pat. No. 4,140,845. This application Nov. 28, 1977, Ser. No. 855,376

Int. Cl.[2] C08G *8/08*

U.S. Cl. 528—139 **3 Claims**

1. In a process for the production of a water-immiscible thermosetting phenol-formaldehyde resin characterized by a large proportion of the linkages between benzene rings being benzyl ether linkages located ortho to the phenolic hydroxyl groups by reacting formaldehyde with phenol at a mole ratio of at least 1:1 in an essentially aqueous reaction medium containing at least one water-soluble metal carboxylate catalyst for the reaction having the formula:

$$(C_nH_{2n+1}COO)_xM$$

where n is an integer from 0 to 10, x is greater than 1 and M is a metal having an atomic number of from 21 to 30, in two stages, wherein, in the first stage, exothermic methylolation of phenol by formaldehyde occurs and, in the second stage, polymerization of the methylolated phenol occurs at least until there separates from the reaction medium a water-immiscible thermosetting phenol-formaldehyde resin characterized by a large proportion of the linkages between benzene rings being benzyl ether linkages ortho to the phenolic hydroxyl groups, and recovering the resin phase from the aqueous phase, the improvement which comprises making the two-phase system more acid prior to recovery of said resin phase, whereby the molecular weight distribution of the resin species in said recovered resin phase may be controlled.

4,184,033

MELT POLYMERIZATION PROCESS FOR INCREASING THE MOLECULAR WEIGHT OF POLY(1,4-BUTYLENE TEREPHTHALATE)

Willem F. H. Borman, Evansville, Ind., assignor to General Electric Company, Pittsfield, Mass.

Filed May 5, 1975, Ser. No. 574,330

Int. Cl.[2] C08G *63/22, 63/18*

U.S. Cl. 528—309 **9 Claims**

1. A method for polymerizing low molecular weight poly(1,4-butylene terephthalate) having an intrinsic viscosity of between 0.3 dl/g and 1.05 dl/g as measured in a 60:40 mixture of phenol/tetrachloroethane at 30° C. to a higher molecular weight, said method comprising melt blending with said low molecular weight poly(1,4-butylene terephthalate) from 0.1 to 5.0 parts by weight per hundred parts by weight of said low molecular weight poly(1,4-butylene terephthalate) of a compound containing at least two aliphatic or cycloaliphatic hydroxyl groups to form a blend of said low molecular weight poly(1,4-butylene terephthalate) and said compound containing at least two aliphatic or cycloaliphatic hydroxyl groups and thereafter heating said blend in a vacuum to form a high molecular weight poly(1,4-butylene terephthalate).

4,184,034

MANGANESE BENZOIN-IMINE CATALYSTS AND PROCESS OF PREPARING POLYPHENYLENE ETHERS USING SAID COMPOUNDS AS CATALYSTS

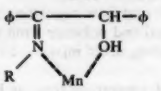
Walter K. Olander, Mt. Vernon, Ind., assignor to General Electric Company, Pittsfield, Mass.

Filed Jan. 26, 1978, Ser. No. 872,439

Int. Cl.[2] C08G *65/44*

U.S. Cl. 528—215 **13 Claims**

1. A catalyst for the oxidative coupling of a phenolic monomer which comprises compounds of the formulae:



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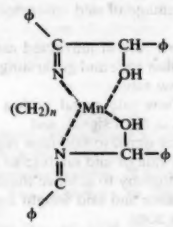


II

wherein R is selected from hydrogen, amino, anilino, alkyl, aminoalkyl and hydroxyalkyl, said alkyl group containing from 1 to 8 carbon atoms; and n is an integer from 2 to 3.

4,184,035

PROCESS FOR NEUTRALIZING HALOGENATED ACID INTERMEDIATES FOR POLYESTER PRODUCTION

Otto K. Goins, Breckenridge, Mich., assignor to Velsicol Chemical Corporation, Chicago, Ill.

Filed Sep. 9, 1974, Ser. No. 504,211

Int. Cl.[2] C08G *63/18*

U.S. Cl. 528—274 **10 Claims**

1. A method for neutralizing inorganic acid impurities in situ

in a polyester polymerization process comprising mixing a halogenated aliphatic or alicyclic polybasic acid or anhydride with other polymerization reactants, such as a polyol or polyols and halogenated or unhalogenated polybasic acids or anhydrides, adding an alkanolamine neutralizing agent to the above mixture, and heating said mixture to an elevated temperature, whereby a polyester of improved color is obtained.

4,184,036

METHOD FOR RECOVERING ATACTIC POLYPROPYLENE

Tetsunosuke Shiomura, Takaishi; Tatuo Ooka, Izumi; Takashi Kobayashi, Takaishi; Kazuo Hagiwara, Izumi, and Hideo Sadotomo, Tokyo, all of Japan, assignors to Mitsui Toatsu Chemicals, Incorporated, Tokyo, Japan

Filed Jun. 12, 1978, Ser. No. 914,510

Int. Cl.² C08F *6/12*

U.S. Cl. 528—499 **14 Claims**

1. In a method for recovering atactic polypropylene from a solution containing the same and by-produced during the preparation of a propylene-containing polymer selected from the group consisting of propylene homopolymer and a copolymer of propylene and at least one other α-olefin by vaporizing the solvent contained in said solution to yield molten atactic polypropylene, the improvement comprising: passing said solution through a tubular, elongated heating zone having a higher pressure inlet and a lower pressure outlet; the temperature of the said solution at the outlet of said heating zone being higher than the melting point of said atactic polypropylene: maintaining a pressure difference of from 3 kg/cm^2 to 50 kg/cm^2 between said inlet and outlet so that the calculated flow velocity of said solution at said outlet is at least 40 m/sec., whereby molten fine particles or atactic polypropylene substantially free of said solvent are formed in suspension in the vaporized solvent; and then separating said fine particles from said solvent in a separation zone.

4,184,037

DIGOXIN OXIDIZED PRODUCT

Samuel Wilkinson, Beckenham, England, assignor to Burroughs Wellcome Co., Research Triangle Park, N.C.

Continuation-in-part of Ser. No. 761,781, Jan. 24, 1977, abandoned, which is a continuation of Ser. No. 662,247, Feb. 27, 1976, abandoned, which is a continuation-in-part of Ser. No. 372,072, Jun. 21, 1973, abandoned. This application Jan. 12, 1978, Ser. No. 868,896

Claims priority, application United Kingdom, 1973, 29279/73; Jun. 21, 1973, 55349/73

Int. Cl.² C07J *19/00*

U.S. Cl. 536—7 **2 Claims**

1. The material obtainable by:

(a) selectively oxidising digoxin at the 15'- and 16'-positions of the terminal digitoxose residue thereof using sodium periodate;

(b) reacting the product of step (a) with tyrosine methyl ester; and

(c) selectively reducing with sodium borohydride the product of step (b); which material

(i) absorbs at a wavelength of 254 mμ when in solution in the mixture methanol:chloroform, 1:9 (v/v);

(ii) is homogeneous by thin layer chromatography using alumina plates and the solvent system methanol:-chloroform, 2:8 (v/v) and has Rf 0.60 in this system;

(iii) gives positive reactions with Pauly's reagent (for tyrosine) and Raymond's reagent (for cardenolides) and has a phenol to cardenolide ratio of 1:1;

(iv) has an infrared absorption spectrum substantially as shown in FIG. 2; and

(v) whereof the nuclear magnetic resonance spectrum recorded at 100 MHz in deuterochloroform/hexadeuterodimethylsulphoxide has the following features:

Protons	Observed chemical shifts (ppm)	Characteristics
Phenolic	6.95	doublet
Phenolic	6.75	doublet
Lactone	5.95	singlet
Angular CH_3	0.80 and 0.92	singlets

where ppm (parts per million) is with reference to tetramethylsilane internal standard.

2. The material obtainable by radio-iodinating the material defined in claim 1 with ^{125}I.

4,184,038

SYNTHESIS OF ERYTHROMYCIN ETHYL CARBONATE

Arthur Bradley, Sandbach, and Roger J. Coles, Gosport, both of England, assignors to American Cyanamid Company, Stamford, Conn.

Filed Jan. 3, 1978, Ser. No. 866,894

Claims priority, application United Kingdom, Jan. 4, 1977, 0081/77

Int. Cl.² C07H *17/08*

U.S. Cl. 536—9 **7 Claims**

1. In a process for preparing erythromycin ethyl carbonate by reacting ethyl chloroformate with erythromycin in the presence of a weak base and thereafter separating erythromycin ethyl carbonate from the reaction mixture, the improvement comprising conducting the reaction in a C_2–C_5 alkanol or a 2-methoxyethanol solvent.

4,184,039

BENZOTHIADIAZINE 1, 1-DIOXIDES

Gianluigi Soldati, 486 Flock Rd., Mercerville, N.J. 08619; David A. Schlichting, Rolling Meadow Ln., Pound Ridge, N.Y. 10576, and Paul Finkelstein, 10 Springwood Dr., Princeton Junction, N.J. 08550

Filed Dec. 1, 1977, Ser. No. 856,497

Int. Cl.² C07D *285/22*

U.S. Cl. 544—12 **2 Claims**

1. 6-chloro-3-dimethylaminoethoxymethyl-2H-1,2,4-benzothiadiazine 1,1-dioxide.

2. 6-chloro-3-cyclohexenyl-3,4-dihydro-2H-1,2,4-benzothiadiazine 1,1-dioxide.

4,184,040

HYDROXYMETHYL-PYRIDINE ESTERS AND A PROCESS FOR THE PREPARATION THEREOF

Ferenc Noteisz; Mihály Bartók; Karoly Felföldi, all of Szeged; Egon Kárpáti, and László Szporny, both of Budapest, all of Hungary, assignors to Richter Gedeon Vegyeszeti Gyar Rt., Budapest, Hungary

Filed Oct. 5, 1977, Ser. No. 839,605

Claims priority, application Hungary, Oct. 8, 1976, RI 598

Int. Cl.² C07D *213/55*

U.S. Cl. 546—342 **4 Claims**

1. An antiarrhythmic pharmaceutically effective compound selected from the group which consists of:

3-[(3-trifluoromethylbenzoyl)-oxymethyl]-pyridine methyliodide;

3-[(4-fluorobenzoyl)-oxymethyl]-pyridine methyliodide; and

2-[(2-chlorobenzoyl)-oxymethyl]-pyridine methyliodide.

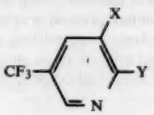
4,184,041

2-SUBSTITUTED-5-TRIFLUOROMETHYLPYRIDINE COMPOUNDS

Ryuzo Nishiyama, Takatsuki; Kanichi Fujikawa, Kusatsu; Takahiro Haga, Kusatsu, and Kuniaki Nagatani, Kusatsu, all of Japan, assignors to Ishihara Sangyo Kaisha Ltd., Osaka, Japan

Filed Mar. 22, 1978, Ser. No. 889,074
Claims priority, application Japan, Oct. 21, 1977, 52-126489
Int. Cl.[2] C07D *213/61*
U.S. Cl. 546—345 3 Claims

1. A 2-substituted-5-trifluoromethylpyridine compound represented by the following formula (I):



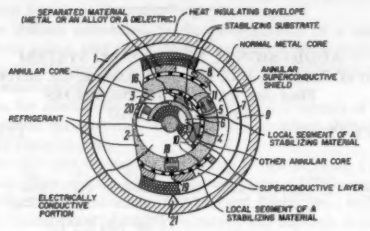
(I)

wherein X represents a chlorine atom, and Y represents a fluorine atom or a chlorine atom.

4,184,042
MULTISECTION SUPERCONDUCTING CABLE FOR CARRYING ALTERNATING CURRENT

Mikhail L. Vulis; Igor V. Rybin; Pavel B. Shenderovich; Valery A. Golenchenko; Igor S. Shevchenko, and Vladimir G. Schedrin, all of Moscow, U.S.S.R., assignors to Gosudarstvenny Nauchno-Issledovatelsky Energetichesky Institut Imeni G.M. Krzhizhanovskogo, Moscow, U.S.S.R.

Filed Dec. 28, 1977, Ser. No. 865,311
Int. Cl.[2] H01B *12/00*
U.S. Cl. 174—15 S 10 Claims



1. A multisection superconductive cable for carrying alternating current, which comprises a hollow cylindrical heat insulating envelope, an annular superconductive shield with a stabilizing substrate disposed within

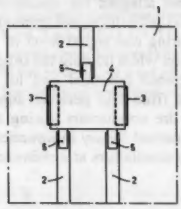
said envelope; an electrically conductive portion for carrying an electrical current disposed within said shield and including at least one conductor assembly of two coaxial cores, one of which cores is annular and provided with a superconductive layer and a stabilizing substrate, the other core being disposed inside said annular core; terminal devices for input and output of power transmitted over the cable; said stabilizing substrate of each section of said electrical portion being formed by local segments of a stabilizing material and separated by a material of a lower electrical conductivity than the stabilizing material, the effective resistance of said stabilizing substrate within a given length of said cable being in excess of the impedance of said electrical portion of said cable length with said cores of said electrical portion being electrically connected at least at the points intended to be used for connection of said terminal devices and said other core of the conductor assembly being made of a normal metal, the thickness of the stabilizing material of said substrate not exceeding the effective depth of penetration of alternating current.

4,184,043
METHOD OF PROVIDING SPACERS ON AN INSULATING SUBSTRATE

Willem C. Hildering, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 21, 1978, Ser. No. 898,653
Claims priority, application Netherlands, May 2, 1977, 7704770
Int. Cl.[2] B05D *5/12;* B01J *17/00;* H01L *7/02;* H01R *43/00*
U.S. Cl. 174—68.5 7 Claims

1. A method of providing spacers on an insulating substrate, said spacers adjusting the thickness of electrical connections between electrical components and said substrate, said method comprising rigidly forming said spacers on said substrate as a thick film pattern by simultaneously providing said spacers on said substrate together with at least one further thick film coating which is required for providing electrical circuits on

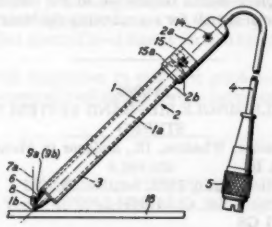


said substrate, said spacer being of the same material as said at least one further thick film coating.

4,184,044
DRAWING PENCIL FOR USE WITH OPTICAL SCANNING APPARATUS

Dietmar Zwerenz, Asslar, Fed. Rep. of Germany, assignor to Ernst Leitz Wetzlar GmbH, Wetzlar, Fed. Rep. of Germany

Filed Jan. 13, 1978, Ser. No. 869,165
Claims priority, application Fed. Rep. of Germany, Jan. 14, 1977, 7700959[U]
Int. Cl.[2] G08B *5/22;* G08C *21/00*
U.S. Cl. 178—18 17 Claims



1. A drawing device for use with optical analytic apparatus having electronic evaluation means which scans a grid plate drawing table and converts an image thereon into an electric signal, comprising:

a. a drawing means having a writing tip portion, said writing tip portion defining said drawing means' longitudinal axis;

b. a magnetic coil scanning element having an axis thereof inclined with respect to said longitudinal axis of said writing tip portion of said drawing means; and

c. means mounted on said drawing means for electrically connecting said magnetic coil scanning element to the electronic evaluation means.

4,184,045
SYSTEM AND METHOD FOR TRANSMISSION OF INFORMATION

Lars H. G. Philipson, Viryelvindsvägen 41, S222 27 Lund, and Gert-Åke G. Hansson, Örnvägen 32, S-222 31 Lund, both of Sweden

Filed May 25, 1978, Ser. No. 909,601
Int. Cl.[2] H04B *3/50*
U.S. Cl. 178—68 13 Claims

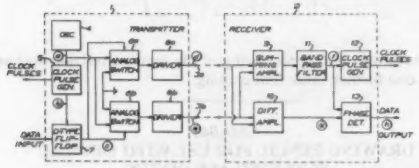
1. A system for serial transmission of binary information comprising:

(a) a transmitter unit adapted to be connected to one end of each conductor of a pair of conductors and including:

(i) a periodic signal generator, for generating a periodic signal;

(ii) means for receiving binary information to be transmitted; and

(iii) connecting means responsive to the received binary information and adapted for connecting the periodic signal from said periodic signal generator to one of the conductors during one signal level of the received binary information while holding the other of the conductors at a reference potential and for connecting the periodic signal from said periodic signal generator to said other of the conductors during the other signal level of the received binary information while holding said one of the conductors at a reference potential; and



(b) a receiver unit adapted to be connected to the other end of each conductor and including:

(i) summing means for summing the received signals on the two conductors to provide a summation signal;

(ii) difference means for subtracting the received signals on the two conductors to provide a differential signal; and

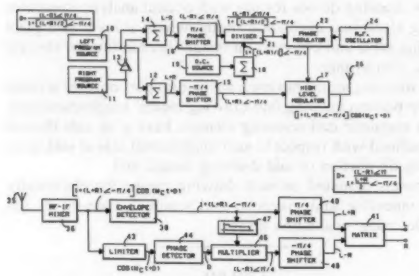
(iii) signalling means responsive to the summation and differential signals for regenerating the binary information.

4,184,046

COMPATIBLE SINGLE SIDEBAND SYSTEM FOR AM STEREO

Norman W. Parker, Wheaton, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Apr. 6, 1978, Ser. No. 894,051
Int. Cl.[2] H04H *5/00*
U.S. Cl. 179—1 GS **8 Claims**



1. A transmitter for providing a compatible AM stereo signal of the form $[1+(L+R)\angle\phi]\cos(\omega_c t+D)$ where D is $[(L-R)\angle\theta]/\{1+[(L+R)/2]\angle\phi$, where ϕ and θ differ by 90° and L and R are distinct program signals, the transmitter comprising in combination:

first adder means for combining additively the L and R program signals;

second adder means for combining subtractively the L and R program signals;

phase shifter means coupled to shift the phase of at least one of the first and second adder means output signals to provide a 90° phase difference between said output signals;

third adder means for adding a DC component to the phase-shifted output of the first adder means;

divider means coupled to divide the phase-shifted output signal from the second adder means by the output signal of the third adder means;

a source of carrier frequency signals;

phase modulating means for modulating the carrier frequency signal with the divider output signal; and

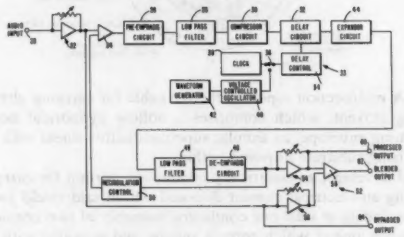
amplitude modulating means for modulating the carrier frequency signal with the phase-shifted output signal from the first adder means.

4,184,047

AUDIO SIGNAL PROCESSING SYSTEM

Robert H. Langford, P.O. Box 9628, Atlanta, Ga. 30319

Filed Jun. 22, 1977, Ser. No. 809,145
Int. Cl.[2] G10H *1/02*
U.S. Cl. 179—1 J **12 Claims**



1. An audio signal processing system comprising:

input means for receiving an audio signal;

a compressor coupled to said input means for compressing the received audio signal;

time delay means coupled to said compressor for delaying the compressed audio signal;

an expandor coupled to said time delay means for expanding the delayed audio signal;

output means for providing a processed output signal from said system; and

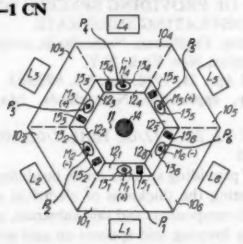
signal blending means coupled to said time delay means and to said compressor for blending the delayed audio signal with the compressed audio signal to provide a blended audio signal.

4,184,048

SYSTEM OF AUDIOCONFERENCE BY TELEPHONE LINK UP

André Alcaide, Longjumeau, France, assignor to Etat Francais, Issy les Moulineux and Sous-marins et du Radio, Paris, both of, France

Filed May 8, 1978, Ser. No. 903,916
Claims priority, application France, May 9, 1977, 77 14092
Int. Cl.[2] H04M *3/56*
U.S. Cl. 179—1 CN **3 Claims**



1. An audioconference system for conference connecting a

plurality of groups of remotely located conferees, said system comprising at each conferee group location:

a loudspeaker assembly;

a plurality of microphones, each microphone of said plurality being assigned to a conferee;

each of said plurality of microphones being spaced apart from said loudspeaker assembly by an equal radial distance to provide a circumferential array of opposed pairs of microphones and each being spaced apart from an adjacent microphone by an equal circumferential distance;

said plurality of microphones being divided into microphone groups, each group having n microphones producing voice signals in the audiofrequency range;

phase shifters connected to the microphones of a microphone group, said phase shifters providing phase angles of the audiofrequency signals transmitted by opposing pairs of microphones equal to $2\pi/n$;

means for mixing the output audiofrequency signals of said opposed microphones which have been phase shifted by said phase shifters;

a detection unit for each microphone which includes a pass band filter tuning onto a characteristic audiofrequency independent of acoustic coupling and the acoustic level of the loudspeaker assembly, whereby the acoustic level of the microphone only provides transmission of audiofrequency by the conferee at a microphone;

a transmit stop band filter connected to said mixing means for cutting out the audiofrequency signals lying in the stop band width of said transmit stop band filter;

address coder means identifying the location of a conferee relative to a specific microphone generating digital signals to identify a conferee who has begun speaking adapted to actuate an indicator for visual verification of the conferee and microphone;

said address coder means being controlled by said pass band filter and said transmit stop band filter generating a carrier output whose frequency lies in said stop band filter band width modulated by said address digital signals;

means for transmitting said audiofrequency signals filtered by said transmit stop band filter and said address digital signal modulated carrier to one or more remote conferee group locations;

means for receiving from one or more remote conferee group locations said audiofrequency signals filtered by said transmit stop band filter and said address digital signal modulated carrier;

a receive stop band filter substantially identical to said transmit stop band filter which is connected to said receiving means;

filtering and demodulating means connected to said receiving means for filtering and demodulating said address digital signal modulated carrier; and

address decoder means controlled by said filtering and demodulating means.

4,184,049

TRANSFORM SPEECH SIGNAL CODING WITH PITCH CONTROLLED ADAPTIVE QUANTIZING

Ronald E. Crochiere, Berkeley Heights, N.J., and Jose M. N. S. Tribolet, S. Domingos de Rana, Portugal, assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Aug. 25, 1978, Ser. No. 936,889

Int. Cl.[2] G10L *1/00*

U.S. Cl. 179—1 SA **16 Claims**

1. A speech signal processing circuit comprising:

means (**101, 103**) for sampling a speech signal at a predetermined rate;

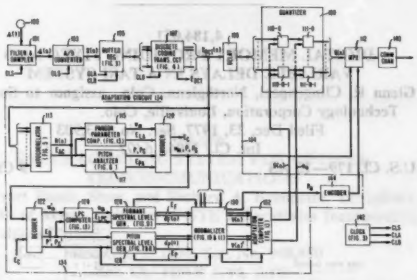
means (**105**) for partitioning said speech signal samples into blocks;

means (**107**) responsive to each block of speech samples for generating a set of first signals each representative of a discrete frequency domain transform coefficient of said block of speech samples at a predetermined frequency;

means (**134**) responsive to said first signals for generating a set of adaptation signals; and

means (**109**) jointly responsive to said adaptation signals and said first signals for producing a set of adaptively quantized discrete transform coefficient coded signals for said block; CHARACTERIZED IN THAT

said adaptation signal generating means (**134**) includes means (**115, 124, 126**) for generating a set of second signals representative of the formant spectrum of said block first signals;



means (**117, 128**) for generating a set of third signals representative of the pitch excitation spectrum of said block first signals;

means (**130**) for combining said set of second signals and said set of third signals to form a set of first pitch excitation controlled spectral level signals for said block first signals; and

means (**132**) responsive to said first pitch excitation controlled spectral level signals for producing said adaptation signals.

4,184,050

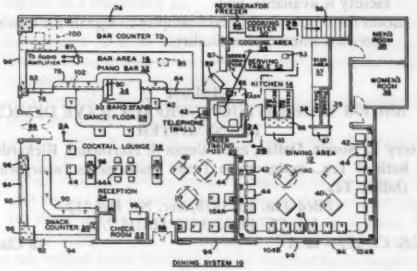
DRINK SERVICE SYSTEM

Seymour C. Yuter, 407 Cedar Dr. West, Briarcliff Manor, N.Y. 10510

Division of Ser. No. 703,952, Jul. 9, 1976, Pat. No. 4,074,793. This application Dec. 1, 1977, Ser. No. 856,253

Int. Cl.[2] H04R *27/00*

U.S. Cl. 179—1 GA **3 Claims**



1. A drink service system comprising:

(a) a bar area,

(b) an adjacent drink service area including a plurality of tables,

(c) a transparent partition substantially enclosing the bar area and separating the bar area from the adjacent drink service area to lower the level of noise transmitted from the bar area to the adjacent drink service area during busy periods of time;

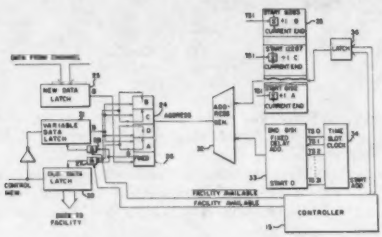
(d) an electronic music source including an audio amplifier;
(e) speaker means responsive to said electronic music source and positioned within said adjacent drink service area;
(f) microphone means mounted within said enclosed bar area for sensing background noise and feeding the sensed background noise to the input of the audio amplifier of said electronic music source; and
(g) noise level control means for controlling the noise audio level in the drink service area whereby the drink service area may be made to sound more busy during lull periods of time.

4,184,051

DIGITAL MEMORY PROVIDING FIXED AND VARIABLE DELAYS IN A TASI SYSTEM

Glenn R. Clingenpeel, Northglenn, Colo., assignor to Storage Technology Corporation, Louisville, Colo.

Filed Dec. 23, 1977, Ser. No. 863,903
Int. Cl.² H04J *6/02*
U.S. Cl. 179—15 AS **9 Claims**



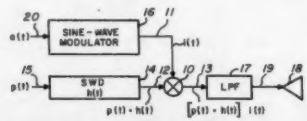
1. A time assignment speech interpolation system comprising:
means for sampling signals detected on each input speech channel;
a random access digital memory connected between said input speech channels and transmission facilities extending to a remote location, said samples being stored in a fixed portion of said memory for a fixed time;
an address generator for generating addresses in a variable portion of said memory and in said fixed portion of said memory,
control means for storing said samples in said variable portion of memory for variable times until a transmission facility is available; and
means for reconstituting said samples to signals for transmission on a transmission facility.

4,184,052

AM/FM TIME DIVISION SURFACE WAVE DEVICE TRANSMITTER

Jerry L. Norris, Dallas, and Clinton S. Hartmann, Richardson, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Jan. 16, 1978, Ser. No. 869,412
Int. Cl.² H04J *3/12*; H03H *7/30*
U.S. Cl. 179—15 A **18 Claims**



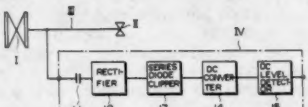
1. A time division sample modulating device for sample modulating electronic information signals comprising:
signal modulator means for receiving input signals a(t) in the audio range and generating information signals i(t) having a bandwidth substantially larger than the bandwidth of the audio range input signals a(t);
electronic signal shaping means having an impulse response h(t) of a predetermined shape and a finite length for receiving input impulse signals p(t) and generating sampling signals p(t) *h(t) as the convolution of the input impulse signals p(t) with the impulse response h(t) thereof; and
mixing means having first and second inputs respectively connected to the outputs of said signal modulator means and said electronic signal shaping means for receiving said information signals i(t) and said sampling signals p(t) *h(t) therefrom and generating electrical output signals proportional to the product of said information signals i(t) and said sampling signals p(t) *h(t).

4,184,053

RINGING SIGNAL DETECTOR

Norio Saneyoshi, Tokyo, Japan, assignor to Iwasaki Tsushinki Kabushiki Kaisha, Japan

Filed Feb. 9, 1978, Ser. No. 876,414
Claims priority, application Japan, Feb. 12, 1977, 52-13513
Int. Cl.² H04M *1/26*
U.S. Cl. 179—84 R **6 Claims**



1. A ringing signal detector, comprising a series diode clipper having an automatically biased clipper level biased by a predetermined constant voltage determined by selected peak values of an input signal, said selected peak values of the input signal exceeding said automatically biased clipper level of said series diode clipper, a DC converter responsive to output pulses from said series diode clipper for converting the output pulses of the series diode clipper to DC signals, a DC level detector responsive to said DC signals for detecting whether or not the DC signals are above a predetermined level and generating an output signal when the level of said DC signals exceeds said predetermined level to indicate a ringing signal has been detected.

4,184,054

KEY TELEPHONE SYSTEM

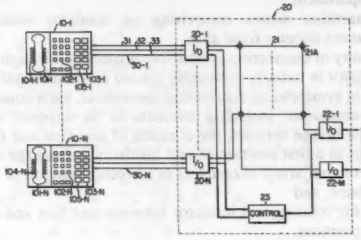
Shin-ichi Shibata, Hino; Yasuji Sato, Hachioji; Yoshikazu Sano, Hino, and Takao Yamamoto, Tanashi, all of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Filed Mar. 21, 1978, Ser. No. 889,657
Claims priority, application Japan, Mar. 28, 1977, 52-34241; Mar. 28, 1977, 52-34246; Mar. 28, 1977, 52-34247; Dec. 27, 1977, 52-159926; Dec. 27, 1977, 52-159943; Jan. 14, 1978, 53-3117; Jan. 14, 1978, 53-3118; Jan. 23, 1978, 53-6051; Jan. 23, 1978, 53-6052
Int. Cl.² H04Q *5/18*
U.S. Cl. 179—99 M **35 Claims**

1. A key telephone system comprising:
a plurality of key telephones each having a handset, a first control signal generator circuit producing an output signal for specifying a line to be used, and first and second key telephone terminal sections;
a plurality of transmission paths each having first, second and third transmission cables;
a key service unit including a crosspoint module, a control section having input and output circuits, at least one first key service terminal section and at least one second key

service terminal section for coupling the crosspoint module with an outside line; and

a plurality of coupling means each including a first coupling section for coupling one of said handsets, one of said first control signal generator circuits, and one of said first key telephone terminal sections with said crosspoint module, the input and output circuits of said control section, through said first, second and third transmission cables, respectively and a second coupling section for coupling said first key service terminal section with one of said second key telephone terminal sections to permit transfer of an information signal between the second key telephone



terminal section and the first key service terminal section through a phantom circuit formed of two of said first, second, and third transmission cables; wherein said control section responds to an up-control signal fed from said first control signal generating circuit via said second transmission cable to provide a control signal to said crosspoint module, thereby connecting said key telephone to said second key service terminal section coupled to a specified line through said first transmission cable and said crosspoint module, and further responds to an incoming call signal to send a down-control signal to said first key telephone terminal section of each of said key telephones through said third transmission cable.

4,184,055

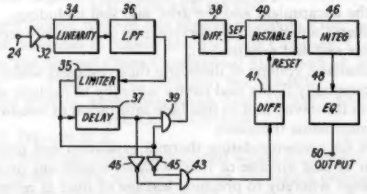
SCANNING SYSTEM FOR REPRODUCTION OF OPTICAL SOUND TRACKS WITH CLEAR AREA NOISE DISCRIMINATOR DELAY MEANS

Ray M. Dolby, San Francisco, Calif., assignor to Dolby Laboratories, Inc., San Francisco, Calif.

Division of Ser. No. 778,870, Mar. 18, 1977, which is a continuation-in-part of Ser. No. 603,671, Aug. 11, 1975. This application Dec. 4, 1978, Ser. No. 967,878

Int. Cl.² G11B 7/00

U.S. Cl. 179—100.3 R **1 Claim**



1. A scanning system for reproducing a variable area optical sound track, comprising scanning means arranged to scan repeatedly across the width of the track to provide a two-level first electrical signal, a bistable circuit for providing a second electrical signal, means for setting the bistable circuit, thereby to set the second signal from a first level to a second level, by a transition in the first signal occurring as the scanning means scan from an opaque area to a clear area of the track and means operative to reset the bistable circuit, thereby to reset the second signal from the second level to the first level, at an instant occurring when the scanning means has scanned back on to an extended opaque area of the track, thereby to ignore non-extended opaque areas occurring within the clear area, said reset means comprising delay means for delaying the first signal and a logic circuit operative to reset the bistable circuit when the first signal and the delayed first signal from the delay means are concurrently at a level corresponding to the opaque area.

4,184,056

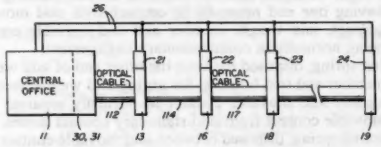
FAULT LOCATING SYSTEM FOR OPTICAL TELECOMMUNICATIONS

E. Evert Basch, Stow, and Richard A. Beaudette, Tewksbury, both of Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.

Filed Oct. 5, 1978, Ser. No. 948,850

Int. Cl.² H04B 3/46, 9/00

U.S. Cl. 179—175.3 F **11 Claims**



1. In combination,

a central office;

means associated with said central office for generating a tone signal;

analog to digital conversion means for converting said tone signal to a unipolar digital signal;

cable driving means for receiving said digital signal and for providing an output for driving an optical cable;

a first optical cable having an input coupled to the output of said cable driving means, and an output;

a first filter, having an input and an output, for passing signals at a frequency f_1;

a first repeater having an input coupled to the output of said first optical cable for reforming the received digital signal before retransmission thereof, said first repeater being coupled to said input of said first filter;

a secod optical cable having an input coupled to an output of said first repeater, and an output;

a second filter, having an input and an output, for passing signals at a frequency f_2;

a second repeater having an input coupled to the output of said second optical cable for reforming the received digital signal before retransmission thereof, said second repeater being coupled to said input of said second filter;

an nth optical cable having an input coupled to an output of the $(n-1)$st repeater, and an output;

an nth filter, having an input and an output, for passing signals at a frequency f_n;

an nth repeater having an input coupled to the output of the nth optical cable for reforming the received digital signal before retransmission thereof, said nth repeater being coupled to said input of said nth filter; and

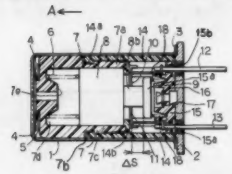
a pair of wires coupling the outputs of said filters to said central office;

wherein n is an integer greater than 2.

4,184,057
INERTIA SWITCH ASSEMBLY

Norio Kumita, Kariya, and Seiichi Narita, Toyohashi, both of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Mar. 31, 1978, Ser. No. 892,135
Claims priority, application Japan, Jun. 15, 1977, 52-71512
Int. Cl.[2] H01H *35/02*
U.S. Cl. 200—61.45 R 11 Claims

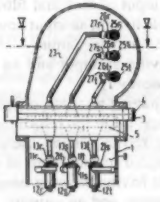


1. An inertia switch apparatus comprising:
a housing,
a stationary contact means disposed in and secured to said housing,
a movable contact normally disposed at a distance from said stationary contact in said housing so as to make contact with said stationary contact means in a predetermined manner,
a weight member slidably disposed in said housing and having one end normally in contact with said movable contact, said weight member and said movable contact being normally in complementary engagement,
a first spring, disposed between the other end of said weight member and said housing, for urging said weight member against said movable contact to normally separate said movable contact from said stationary contact means, and
a second spring, disposed between said movable contact and said housing, for urging said movable contact against said weight member so as to close said movable contact to said stationary contact means when said weight member is separated from said movable contact.

4,184,058
POLYPHASE ISOLATOR SWITCHES

Gijsbert W. Irik, Bilthoven; Pieter Marien, de Meeren, and Marius F. Fierst van Wijnandsbergen, Breukelen, all of Netherlands, assignors to Coq B.V., Utrecht, Netherlands

Filed Jul. 12, 1977, Ser. No. 814,934
Claims priority, application Netherlands, Jul. 23, 1976, 7608236
Int. Cl.[2] H01H *3/00*
U.S. Cl. 200—153 P 7 Claims

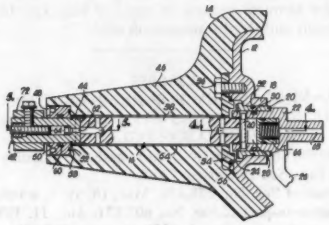


1. High voltage polyphase switchgear comprising, in combination:
metallic envelope means for containing dielectric gas under pressure;
partition means for separating said envelope means into adjacent compartments which are separated in gas tight fashion from each other;
a set of electrical conductors in one compartment and a set of electrical conductors in the other compartment, the conductors of each set being spaced from each other and from the envelope means whereby to conduct polyphase current, a first array of spaced contacts within said one compartment connected respectively to the conductors of that set within said one compartment and a second array of spaced contacts in said one compartment, pairs of contacts of the first and second arrays being coplanar and similarly spaced, and the contacts of said second array being connected to said envelope means, a third array of spaced contacts within said other compartment connected respectively to the conductors of that set within said other compartment;
said partition means comprising an insulator rotatably mounted about a fixed axis;
a plurality of connecting conductors projecting through said insulator in radially outwardly spaced relation to said axis and in symmetrical distribution thereabout, each connecting conductor including contacts at its opposite ends which bridge between the contacts of said first and third arrays in a first position of said insulator and engage only said second array of contacts in a second position of said insulator; and
means for rotating said insulator between said first and second positions.

4,184,059
ENCAPSULATED VACUUM SWITCH HAVING IMPROVED SWITCH ARM SEAL

Richard Graham, Centralia; Eugene L. Kamp, Fulton; Armin M. Bruning; Earl S. Gritton, both of Centralia, and L. Ronald Azdell, Mexico, all of Mo., assignors to A. B. Chance Company, Centralia, Mo.

Filed Oct. 31, 1977, Ser. No. 846,844
Int. Cl.[2] H01H *9/04, 21/08*
U.S. Cl. 200—302 7 Claims

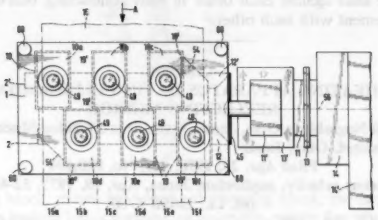


1. In an encapsulated, externally operable electrical device having a shiftable actuating arm penetrating through said encapsulant, an improved, high dielectric strength seal between the encapsulant and the arm, said seal including:
a hermetic, annular cavity surrounding said arm between the latter and said encapsulant;
a pressurized volume of dielectric fluid disposed within and substantially filling said cavity whereby to exclude all air from the cavity and to preclude infiltration of conductive contaminants thereinto;
means for accommodating thermal expansion and contraction of said volume of fluid without significant pressure change whereby to preclude leakage of fluid at relatively high temperature as well as prevent cavitation in the fluid at relatively low temperature; and
externally accessible valve means for permitting said dielectric fluid to be introduced into said cavity subsequent to encapsulation of said device,
said valve means comprising an externally-opening passage communicating with said cavity and a removable seat in said passage for selectively opening and closing the latter, said valve means being disposed on said arm.

4,184,060
PROCESS FOR DEVELOPING A TWO-COMPONENT DIAZOTYPE MATERIAL ON A NON-METALLIC CARRIER, WHICH MATERIAL CAN BE DEVELOPED BY THE INFLUENCE OF HEAT

Helmut Lembens, Wiesbaden, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Nov. 23, 1977, Ser. No. 854,242
Claims priority, application Fed. Rep. of Germany, Nov. 25, 1976, 2653461
Int. Cl.[2] H05B 9/06; G03C 5/18
U.S. Cl. 430—151 23 Claims



1. In the process for developing a two-component diazotype material on a non-metallic carrier which can be developed by the influence of heat, and contains, in particular, compounds which can be decomposed under the influence of heat and produce in this process an alkaline environment, the heat influence being produced by at least one electromagnetic radiation radiated from a power transmitter through which radiation the diazotype material is transported,

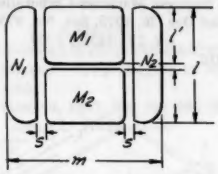
the improvement comprising subjecting the diazotype copying material to microwave radiation with a frequency higher than 10^9 Hz without a heat-generating body being placed between the power transmitter and the diazotype material, and using a uniformly radiating microwave power transmitter, extending across a web width of the two-component diazotype material, composed of a number of discrete transmitter elements which are arranged in at least two rows one behind the other in a running direction of the carrier, a shared waveguide for the power supply to the transmitter elements from a microwave generator to the microwave power transmitter and a T-junction branching from the waveguide to connect with the feeder lines which are coupled to the corresponding transmitter elements via coupling loops.

4,184,061
BROWNING VESSELS WHICH USED TOGETHER WITH MICROWAVE OVENS

Katsuhiro Suzuki, Nagoya, and Masaru Kinoshita, Otsu, both of Japan, assignors to Nippon Electric Glass Company, Limited, Shiga and Narumi China Corporation, Aichi, both of, Japan

Filed Mar. 8, 1978, Ser. No. 884,601
Claims priority, application Japan, Mar. 11, 1977, 52-27433
Int. Cl.[2] H05B 9/06
U.S. Cl. 219—10.55 E 11 Claims

1. In a browning vessel for foodstuff which is adaptable to be used together with a microwave oven and which comprises a glass or glass ceramic dish having a wide bottom wall on which foodstuff is received, and an electroconductive film pattern coated onto a lower surface of said bottom wall, the improvement comprising said electroconductive film pattern comprising a plurality of separated film sections, each adjacent two sections being spaced from one another by a narrow non-electroconductive gap, each one of said electroconductive film sections being less than 250 cm^2 in area, the sum of the areas of said electroconductive film sections being at least 50% of the area of the surface of said bottom wall, and each corner of said electroconductive film sections being formed in a rounded form, whereby the bottom wall surface may be uniformly

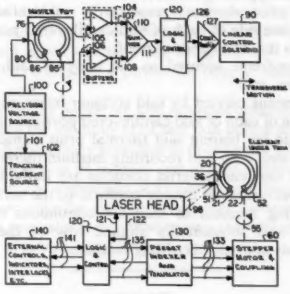


heated to uniformly brown foodstuff in use of said vessel together with said oven.

4,184,062
LASER RESISTANCE TRIMMER

Robert A. Schmidt, 325 Third Ave., Indialantic, Fla. 32903

Filed Oct. 25, 1977, Ser. No. 845,356
Int. Cl.[2] B23K 9/00
U.S. Cl. 219—121 L 23 Claims



1. A method for adjusting the resistance value of an elongated resistance film of typically inconsistent density which has been deposited upon an insulative substrate workpiece, said method comprising the steps of:

(a) defining along a longitudinal axis of the resistance film a start point and a movable wiper point;

(b) measuring the resistance along the resistance film between said start point and said wiper point;

(c) generating a master resistance signal representative of a specified resistance along the resistance film between said start point and said wiper point;

(d) comparing said measured resistance with said master resistance signal and generating an error signal responsive to the differences therebetween;

(e) trimming the effective width of the resistance film in a direction generally transverse to said longitudinal axis responsive to said error signal, thereby reducing the difference between said measured resistance and said master resistance signal;

(f) moving said wiper point generally along said longitudinal axis while trimming, thereby increasing the effective separation between said start point and said wiper point while trimming the effective width of the resistance film; and

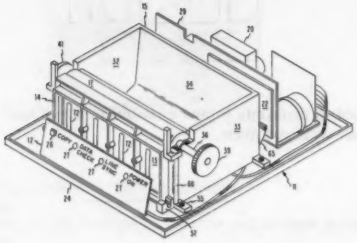
(g) repeating steps (b) through (g).

4,184,063

THERMAL PRINTER WRITE HEAD ASSEMBLY

Gerald M. Heiling, Pine Island; LaVerne F. Knappe, Rochester, and John L. Regehr, Stewartville, all of Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 26, 1978, Ser. No. 973,213
Int. Cl.[2] H05B 1/00
U.S. Cl. 219—216 10 Claims



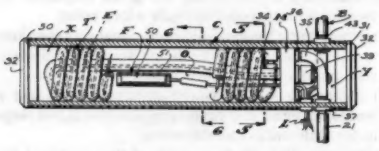
1. A thermal printer comprising
a platen element;
means for advancing a recording medium in unison with the surface of said platen element; and
a thermal print head mounting assembly including:
a resilient planar supporting member,
slot means extending partially across said member to form a plurality of cantilevered portions extending from the body of said supporting member,
thermal print elements respectively substantially aligned along one side of each of said cantilevered portions adjacent to the distal ends thereof,
a stiffener-frame secured to the body of said supporting member, and
biasing means carried by said stiffener-frame and engaging the side of each of said cantilevered portions opposite said one side for biasing said thermal print elements toward said platen with said recording medium therebetween,
whereby said cantilevered portions are individually resiliently moveable to closely conform to the surface of said recording medium to maintain continuous contact between said substantially aligned row of thermal print elements and said recording medium.

4,184,064

WATER HEATING MEANS

David E. Williams, Hemet, Calif., assignor to Amark Industries, Inc., Scanacinty, Calif.

Filed Nov. 28, 1977, Ser. No. 855,406
Int. Cl.[2] F24H 1/16
U.S. Cl. 219—303 6 Claims



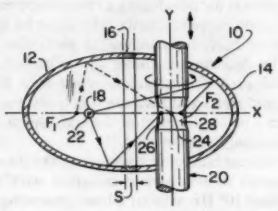
1. A water heater including an elongate tubular case, a block engaged within the case and a plug engaged within the case in spaced relationship with the block and cooperating therewith to define an air filled heater chamber, an elongate liquid conducting heater tube established of a material having a high index of heat conductivity and having a helically wound portion substantially coextensive with and arranged within the heater chamber in supported engagement with the case and defining a central longitudinal opening within the chamber, said tube has inlet and outlet ends, connecting means connecting the ends of the tube with water supply and delivery lines, an elongate waterproofed and electrically insulated resistance heater element extending longitudinally through said tube and having an end portion extending from within the tube, a power supply line extending from a power source to said end portion of the heater element and control means to control the supply of power from the power line to the element and including a temperature sensing device positioned in said opening in the chamber and operable to stop and start the flow of power to the element when the temperature of the air within the opening in the chamber drops below and rises above a set temperature, the adjacent convolutions of the helically wound portion of the tube abut against each other in heat conducting bearing engagement with each other.

4,184,065

HEATING APPARATUS HAVING ELLIPSOIDAL REFLECTING MIRROR

Kanji Nagashima, Otsu, Japan, assignor to Nichiden Machinery, Limited, Otsu, Japan

Filed Apr. 20, 1978, Ser. No. 898,184
Claims priority, application Japan, Apr. 28, 1977, 52-49173
Int. Cl.[2] H05B 1/00
U.S. Cl. 219—349 10 Claims



1. A heating apparatus comprising divided ellipsoidal reflecting mirror means having a first mirror member with a first focal point and a second mirror member with a second focal point, said first and second focal points being located on a common axis (X), a single heat source disposed in the vicinity of said first focal point within said reflecting mirror means, means for holding a substance to be heated by the radiation generated by said heat source so that said substance is disposed in the vicinity of said second focal point within said reflecting mirror means, a substantially straight additional spacer member (16 or 49) having a given length in the direction of the common axis (X), said additional spacer member being interposed between said first and second mirror members to correspondingly increase the spacing between the first and second focal points, said heat source having a center located in a first position spaced from said first focal point and wherein said substance to be heated has a molten zone with a center (28) located at a second position spaced apart from said second focal point to obtain a desired substantially uniform temperature distribution all around said substance to be heated.

4,184,066

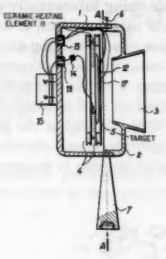
HEAT RADIATION REFERENCE SOURCE FOR PHOTOTHERMOMETRY

Jan Svoboda, Ostrava-Poruba, Czechoslovakia, assignor to Vyzkumny ustav hutnictvi zeleza, Dobra, Czechoslovakia

Filed Jul. 13, 1977, Ser. No. 815,431
Claims priority, application Czechoslovakia, Jul. 13, 1976, 4633/76
Int. Cl.[2] H05B 3/00
U.S. Cl. 219—354 4 Claims

1. A reference source of heat radiation for the contactless measuring of an observed object by photothermometry, comprising a cup-shaped housing having forwardly open side walls

and a rear wall standing transverse to said side walls, a forwardly facing flat heat-radiating target made of refractory material disposed transverse to the side walls of the housing intermediate the axial length of the housing, a flat heating block disposed parallel to the radiating target and spanning the central portion of the housing, means for clamping the rear surface of the target tightly against the forward surface of the



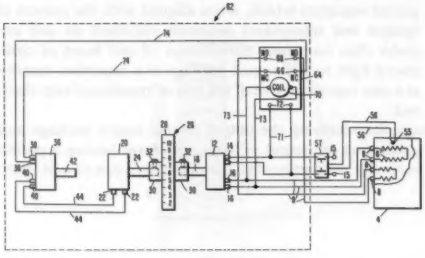
heating block, means for heating the heating block, the target and the heating block forming an assembly, means for adjusting the assembly transversely of the side walls of the housing, means for adjusting the target in its plane with respect to the clamping means, a light impervious shielding cover on the forward end of the housing, and a centrally disposed radiation-limiting hood mounted on the cover and presenting an opening therethrough aligned with the target.

4,184,067

HEAT CONTROL APPARATUS

Steven B. Cress, 1330 Desert Willow La., Diamond Bar, Calif. 91765

Filed May 2, 1977, Ser. No. 792,501
Int. Cl.[2] H05B *1/02*
U.S. Cl. 219—490 **13 Claims**



1. An automatic heat control apparatus for use with an electric heating element, comprising:

a power controller having a plurality of timing cycles, each of said timing cycles comprising an on interval during which said controller supplies electric current to said heating element and an off interval during which said controller supplies no current to said heating element, said controller further having a means for adjusting the duration of said on interval relative to said off interval, said adjusting means including a thermomechanical timing mechanism thermally responsive to any fluctuations of electric current and voltage applied to said heating element and thermally sensitive to changes in the ambient temperature of the environment of said heating element; and

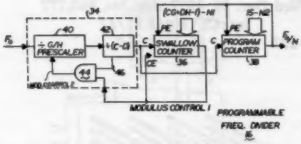
motor means directly mechanically connected to said adjusting means for automatically, mechanically regulating said adjusting means over a predetermined time period to gradually increase the duration of said on interval and decrease the duration of said off interval to control the rate of temperature increase produced by said heating element, said motor means being the sole means for automatically regulating said adjusting means.

4,184,068

FULL BINARY PROGRAMMED FREQUENCY DIVIDER

Clyde Washburn, Fairport, N.Y., assignor to Harris Corporation, Cleveland, Ohio

Filed Nov. 14, 1977, Ser. No. 851,365
Int. Cl.[2] H03K *21/36*
U.S. Cl. 235—92 CC **7 Claims**



1. A dual modulus prescaler having two selectable moduli, one of which is a power of two, comprising:

a high speed, non-binary prescaler adapted to respond to an input signal for providing a divider output signal whose frequency is 1/Mth the frequency of said input signal, M being the modulus of said non-binary prescaler, wherein M is selected to be one of two values G and H by a modulus control signal, neither value being a power of two but where (CG+DH) is a power of two, C and D being integers, and

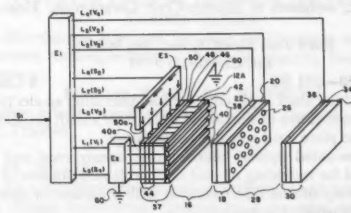
adapter means for providing said modulus control signal for controlling the modulus M of said non-binary prescaler to force said non-binary prescaler to operate in a selected one of two sequences of moduli, one of said sequences being defined by the expression (CG+DH), and for providing an output pulse for each said sequence, whereby a dual modulus prescaler is provided having two selectable moduli, one of which is a power of two.

4,184,069

ORTHOGONAL ARRAY FACEPLATE WAFER TUBE DISPLAY

David A. Bosserman, Alexandria, Va., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Mar. 28, 1978, Ser. No. 891,107
Int. Cl.[2] H01J *43/04, 31/26*
U.S. Cl. 250—213 VT **4 Claims**



1. A picture element array image intensifier tube comprising:

an output assembly in proximity focused position to a microchannel plate electron multiplier,

an orthogonal array faceplate in proximity focus with said microchannel plate electron multiplier, said faceplate having an N-element one-dimensional photocathode array on the inner surface thereof and having an M-element videodriven one-dimensional electroluminescent array on the outer surface thereof which is orthogonal to said one-dimensional photocathode array; and

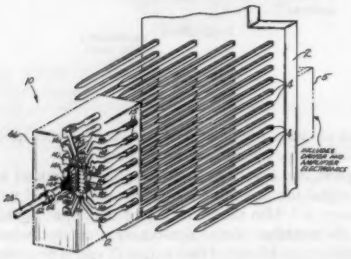
control electronic means biasing said M-element videodriven one-dimension electroluminescent array and said N-element one-dimensional photocathode array for providing MXN Pixels at the output thereof.

4,184,070

CONNECTOR APPARATUS

Lyle E. McBride, Jr., Norton, Mass., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 23, 1977, Ser. No. 863,777
Int. Cl.[2] H01J *31/12*
U.S. Cl. 250—227 **9 Claims**



1. Interface apparatus for use with a backplane having first and second sides adapted to mount electronic modules on said first side, electrical connecting means disposed on said second side providing interconnection with said electronic modules comprising a housing having an aperture formed in a wall of the housing, a fiber optic cable extending from without said housing through said aperture and terminating in said housing, connector contact means mounted in said housing, said connector contact means comprising a plurality of elements having first and second ends, each said fiber end adapted to be electrically connected to the electrical connecting means disposed on said second side of the backplane, means having optically active areas mounted in said housing and having leads extending from said optically active area means to said second ends of said elements, means disposing said optical fibers in optical communication with said optically active areas and electronics associated with said optically active areas means mounted on said first side of said backplane.

4,184,071

MODULAR ENCODER

Ronald W. Fryer, Santa Barbara, and Jess Guerra, Goleta, both of Calif., assignors to Electro-Craft Corporation, Hopkins, Minn.

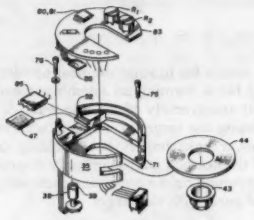
Filed Jan. 12, 1978, Ser. No. 868,887
Int. Cl.[2] G01D *5/34*
U.S. Cl. 250—231 SE **8 Claims**

1. A modular shaft angle encoder for generating an electrical signal representative of the rate of rotation of a shaft projecting from a base plate, said encoder comprising:

a hub mounted optical encoder disc constructed and arranged for mounting on said shaft, at least a portion of the periphery of said disc inscribed with a pattern of opaque and transparent segments;

a unitary housing having a wall portion and a base portion, the base and wall portions of said housing including cutaway portions to permit said housing to be mounted on said base plate with an axis of said unitary housing aligned with the center line of said hub mounted optical encoder disc mounted on said shaft, and wherein the base portion of said unitary housing has first and second mounting holes located a fixed distance from said axis of said housing on a straight line passing through said axis of said housing, said first mounting hole having a diameter slightly greater than the diameter of the mounting screw used to secure it to said base plate, the diameter of said second mounting hole being substantially greater than the diameter of the screw used to attach it to said mounting plate to permit rotation of said housing about a pivot point defined by said first mounting hole to permit alignment of said axis of said housing with the center line of said shaft,

a source of light mounted on said housing for generating a collimated beam of light directed at the pattern of transparent and opaque segments on said encoder disc mounted on said shaft when said housing is mounted on said base plate;



a sensor package mounted on said housing to receive portions of said collimated beam of light passing through the pattern of transparent and opaque segments on said encoder disc;

a stator mounted on said housing between said source of light and said sensor package, at least a portion of said stator being inscribed with a pattern of opaque and transparent segments which, when aligned with the pattern of opaque and transparent segments inscribed on said encoder disc, interrupts transmission of said beam of collimated light to said sensor package in a repetitive manner at a rate representative of the rate of rotation of said shaft; and

means for receiving the output of said sensor package and generating an output voltage waveform having a period inversely proportional to the rate of rotation of said shaft.

4,184,072

SOLAR CELL ANGULAR POSITION TRANSDUCER

Maynard C. Sandford, Hampton, and David L. Gray, Newport News, both of Va., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Feb. 9, 1978, Ser. No. 876,299
Int. Cl.[2] G01D *5/34*
U.S. Cl. 250—231 SE **10 Claims**

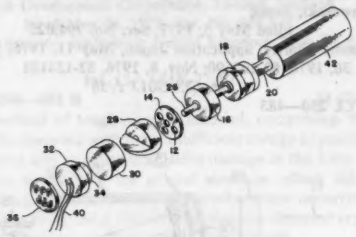
1. A device for measuring the angular displacement of an object comprising:

(a) radiation means for producing a constant radiation,

(b) radiation sensing means comprised of two radiation sensitive parts that sense the relative amount of the radiation impinging thereon to determine the angular displacement of said object, and

(c) radiation obstruction means that rotates in unison with the object being angularly displaced in order to obstruct said radiation such that said radiation impinges upon vary-

ing areas of one of said radiation sensitive parts with respect to the other of said radiation sensitive parts, said



radiation sensitive parts producing an output that is directly proportional to the rotation of said object.

4,184,073

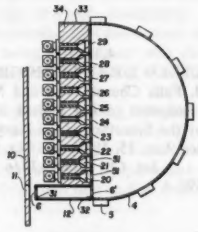
FAST RESPONSE ELECTRON SPECTROMETER

Raine M. Gilbert, Centreville, Va., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed May 25, 1978, Ser. No. 909,412

Int. Cl.² H01J *39/00*

U.S. Cl. 250—305 **4 Claims**



1. An electron spectrometer having a relatively high signal-to-noise ratio comprising,

magnetic curving chamber means for causing electrons inputted thereto to travel in arcs having respective dimensions corresponding to the respective energies of said electrons,

a plurality of electron sensing means disposed in a row for receiving said electrons after being curved in said arcs, and,

a plate and a screen, both of which separate said sensing means from said curving chamber, the plate having a plurality of apertures therein, each aperture being directly in front of and providing access to a respective sensing means, and the screen comprising a conducting grounding screen having openings substantially smaller than said apertures wherein said electron sensing means is the termination of a transmission line.

4,184,074

NONDISPERSIVE INFRARED GAS ANALYSIS DEVICE

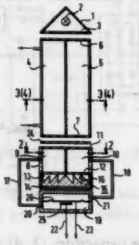
Otto H. Blunck, Trelleborgallee 2, Lubeck-Travemunde, Fed. Rep. of Germany

Filed Jul. 6, 1978, Ser. No. 922,315

Claims priority, application Fed. Rep. of Germany, Nov. 15, 1977, 2751047

Int. Cl.² G01N *21/26*

U.S. Cl. 250—345 **6 Claims**



1. A nondispersive infrared gas analysis device comprising

first and second gas-containing cuvettes adapted, respectively, to contain a gas to be analyzed and a comparison gas, said cuvettes having radiation transparent means at both ends thereof;

a source of radiation coupled to said transparent means at one end of the cuvettes to pass isophase radiation thereto;

a detector unit at the other end of said cuvettes to receive radiation emanating from said cuvettes for producing a differential signal representative of differences in radiation emanating from said cuvettes, said detector unit comprising:

a body;

means defining first and second reception chambers in said body adapted to receive radiation from said first and second cuvettes, respectively;

filter means between said cuvettes and said chambers for selectively passing into said chambers radiation at a predetermined wavelength;

an input window covering an end of said chambers adjacent said filter means;

a second window covering the other end of said chambers, said second window being formed to be substantially free of reflection;

means defining an infrared absorption chamber hermetically sealed from said reception chambers by said second window for absorbing infrared energy passing through said reception chambers; and

means coupled to said reception chambers for producing the differential signals.

4,184,075

X-RAY DIAGNOSTIC GENERATOR COMPRISING AN INVERTER FEEDING THE HIGH VOLTAGE TRANSFORMER

Otto Ebersberger, Erlangen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Sep. 8, 1978, Ser. No. 940,784

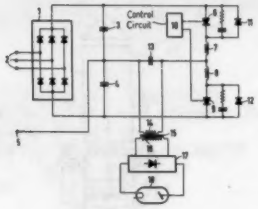
Claims priority, application Fed. Rep. of Germany, Nov. 11, 1977, 2750544

Int. Cl.² H05G *1/00*

U.S. Cl. 250—402 **1 Claim**

1. An x-ray diagnostic generator comprising an x-ray tube, a high voltage transformer feeding the x-ray tube, an inverter connected to the input of the high voltage transformer, and a power rectifier feeding the inverter, characterized in that the power rectifier (1) is a three phase rectifier, two capacitors (3, 4) being connected in series across the three phase rectifier to

form a capacitor series circuit (3, 4) and having a connection point for receiving a neutral supply conductor, a further series circuit comprising an electronic switch (6), two inductances (7, 8), and an additional electronic switch (9) connected in parallel with the capacitor series circuit, the electronic switches (6, 9) being controllable for the purpose of alternate switching-on thereof, an oscillatory capacitor connected between the con-



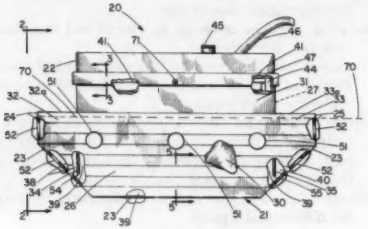
nection points of the capacitors (3, 4) and the inductances (7, 8), the oscillatory capacitor (13) having a primary winding (14) of the high voltage transformer (15) connected therewith, and a diode (11, 12) connected in parallel with each electronic switch (6, 9), each diode being connected such that it assumes the discharge current of the oscillatory capacitor (13) pursuant to opening of the corresponding electronic switch (6, 9).

4,184,076

ULTRAVIOLET WATER PURIFIER

Melvin N. Kosnoff, Goshen, Ind., assignor to Conviron, Inc., Goshen, Ind.

Filed Sep. 8, 1978, Ser. No. 940,762
Int. Cl.[2] G01N *21/24*
U.S. Cl. 250—437 **12 Claims**



1. An ultraviolet water purifier for use with an aquarium which comprises:

a receptacle member including a bottom surface portion and a plurality of side walls extending upwardly from and being joined around said bottom surface portion so as to define an open void region;

a plurality of apertures extending through said side walls and communicating with said open void region, said apertures providing flow communication from said aquarium through said open void region and back into said aquarium;

a plurality of removable plug members received by selected ones of said plurality of apertures for closing said selected ones of said plurality of apertures thereby creating a selected flow path through said open void region; and

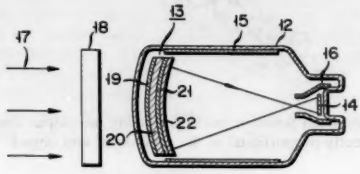
a source of ultraviolet light disposed atop said open void region.

4,184,077

INPUT SCREEN OF AN IMAGE INTENSIFIER

Hiroshi Washida, Kawasaki, and Tomiya Sonoda, Machida, both of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Filed May 5, 1977, Ser. No. 794,025
Claims priority, application Japan, May 11, 1976, 52-52840; Aug. 30, 1976, 52-102690; Nov. 8, 1976, 52-133181
Int. Cl.[2] G01J *1/58*
U.S. Cl. 250—483 **8 Claims**



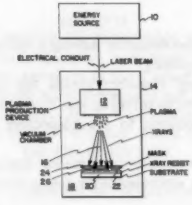
1. An input screen of an image intensifer for converting incident radiation into electrons, comprising an aluminium substrate provided with a mosaic surface prepared by anodizing, sealing process and heat treatment, said mosaic surface including a porous layer of aluminium oxide on said surface formed by said anodizing and sealing process and a large number of narrow grooves and numerous islands defined by said narrow grooves; a fluorescent layer formed on the aluminium oxide layer as crystals and having cracks above the narrow grooves and a large number of columnar blocks defined by the cracks which are arranged substantially parallel with each other; and a photocathode provided on said fluorescent layer.

4,184,078

PULSED X-RAY LITHOGRAPHY

David J. Nagel, Falls Church, Va., and Martin C. Peckerar, Bowie, Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 15, 1978, Ser. No. 933,928
Int. Cl.[2] G03B *41/16*
U.S. Cl. 250—492 A **10 Claims**



1. A soft x-ray lithographic system which comprises:

a housing;

means for evacuating said housing;

means for producing an x-ray-emitting plasma; and

a mask x-ray-resist substrate combination for replicating a desired pattern on said substrate.

4,184,079

RADIATION TOUGHENING OF DIAMONDS

John A. Hudson, Radley; David J. Mazey, Abingdon, and Richard S. Nelson, Reading, all of England, assignors to National Research Development Corporation, London, England

Filed May 26, 1978, Ser. No. 910,127
Claims priority, application United Kingdom, May 26, 1977, 22178/77
Int. Cl.² A61K *27/02*
U.S. Cl. 250—492 B 11 Claims

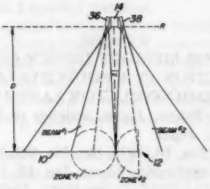
1. A method of toughening a diamond, comprising: bombarding the diamond with ions of sufficient energy to penetrate the diamond and to cause irradiation damage in the form of a dislocation network in the crystal structure which inhibits microcleavage of the diamond, said bombardment occurring at a temperature of at least 500° C. such that the diamond crystal structure is maintained during the bombardment.

4,184,080

RATIOMETRIC EDGE DETECTOR SYSTEM

William A. Massey, Mt. Holly, N.J., assignor to Molins Machine Company, Inc., Cherry Hill, N.J.

Filed Jun. 30, 1977, Ser. No. 811,659
Int. Cl.² G01N *21/30*
U.S. Cl. 250—548 18 Claims



1. A ratiometric edge detector system for use in controlling the position of the edge of a web, comprising:

first means for illuminating first and second zones on a web, said first zone being of a greater area than said second zone and said second zone having as a border an edge of the web,

second means for optically sensing light reflected from said first and second zones on said web, and

third means operatively connected to said second means for generating a control signal proportional to the ratio of light reflected from said first and second zones.

4,184,081

METHOD FOR CHECKING BANKNOTES AND APPARATUS THEREFOR

Giorgio Bergamini, Bari, Italy, assignor to Nuovo Pignone S.p.A., Florence, Italy

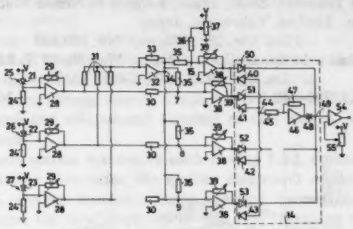
Filed Oct. 28, 1977, Ser. No. 846,545
Claims priority, application Italy, Nov. 3, 1976, 28981 A/76
Int. Cl.² G06K *5/00*
U.S. Cl. 250—556 20 Claims

5. A method for checking the genuineness of a banknote by utilizing signals provided by photosensitive elements in correspondence with a preselected set of points on said banknote, said method comprising the steps of:

(a) amplifying each signal provided by each photosensitive element according to a first predetermined amplification coefficient particular to each point on the banknote up to a normalized value so as to provide a plurality of normalized signals;

(b) processing said normalized signals to provide an average signal representative of the average of the values of said normalized signals;

(c) comparing said average signal with each of said normalized signals to provide a plurality of primary deviation signals;



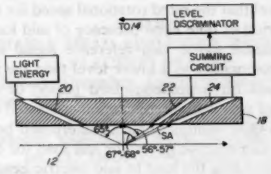
(d) detecting that the value of each of said primary deviation signals lies within a preselected calibration range.

4,184,082

LINEAR FLAW DETECTOR

Patrick J. Peoples, Intervale, N.H., assignor to Howell Laboratories, Incorporated, Bridgton, Me.

Continuation of Ser. No. 810,406, Jun. 27, 1977, abandoned, which is a continuation of Ser. No. 638,290, Dec. 8, 1975, abandoned. This application Oct. 2, 1978, Ser. No. 947,518
Int. Cl.² G01N *21/32*
U.S. Cl. 250—572 17 Claims



1. A sensing unit to detect flaws on a surface wherein there is relative movement between the surface and the sensing unit which comprises:

(a) means to provide an incident beam of light energy which strikes and is reflected from a portion of the surface, the angle of the incident beam being greater than 45° in reference to a plane normal to the surface;

(b) at least two sensors, disposed above and below the theoretical specular angle to sense high and low reflected energies from that portion of the surface that intercepts and reflects the incident beam and to provide two types of signals at high and low angles in reference to the theoretical specular angle;

background signals at the high angle which background signals are diminished with reference to signals corresponding to a flaw and background signals at the low angle, which background signals are accented with reference to signals corresponding to the flaw in said surface;

(c) means to process the two types of signals corresponding to the energies to distinguish further the signals corresponding to the flaw from the background signals; and

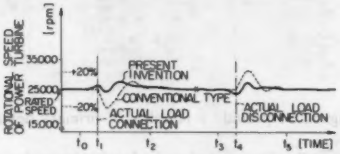
(d) means to output said distinguished signals.

4,184,083

CLOSED LOOP ROTATIONAL SPEED CONTROL SYSTEM FOR GAS TURBINE ENGINE ELECTRIC GENERATOR

Tohru Takeuchi, Zushi, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed Apr. 28, 1978, Ser. No. 900,865
Claims priority, application Japan, May 30, 1977, 52-62976
Int. Cl.[2] F02C *9/04*; G05D *13/00*
U.S. Cl. 290—40 C **16 Claims**



1. A closed loop rotational speed control system for a prime mover of an electric generator, said system including, a fuel control valve for controlling the fuel flow rate to be supplied to the prime mover for regulating the rotational speed of said prime mover; a rotational speed sensor for producing a signal indicative of the rotational speed of the prime mover; and a valve control signal generator for generating a control signal with which the fuel control valve is controlled, by comparing the magnitude of the signal indicative of the rotational speed and a reference signal the magnitude of which normally corresponds to a rated rotational speed; wherein the improvement comprises:

(a) load ON-OFF control means for producing load connection and disconnection command signals;

(b) a reference signal generator connected to said load ON-OFF control means for producing said reference signal, said reference signal assuming a level corresponding to a higher level that the rated rotational speed for a predetermined period of time upon presence of said load connection command signal, said reference signal assuming a level corresponding to a lower level than the rated rotational speed for a predetermined period of time upon presence of said load disconnection command signal;

(c) load ON-OFF switching means interposed between the output of said electric generator and load for connecting and disconnecting the load to said electric generator; and

(d) a delay circuit connected to said load ON-OFF control means for controlling said load ON-OFF switching means in response to said load connection and disconnection command signals.

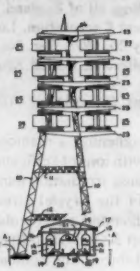
4,184,084

WIND DRIVEN GAS GENERATOR

Robert Crehore, 20661 McClellan, Cupertino, Calif. 95014

Filed Feb. 24, 1978, Ser. No. 880,808
Int. Cl.[2] F03B *13/00*
U.S. Cl. 290—55 **6 Claims**

1. A wind driven gas generator comprised of a wind driven element rotating about a vertical rotational axis which is supported in a fixed position by a support structure, a homopolar direct current generator having a stationery field element and a rotating disc assembly, the rotating disc assembly being mounted on the vertical rotational axis of the wind driven element, conductors mounted on the rotating disc assembly, the conductors terminating in slip rings at both the inner and outer edge of the rotating disc assembly, the stationery field element comprised of two disc-shaped poles having fins, a field coil housing connecting the disc-shaped poles annularly at the outer edge of the disc-shaped poles, an annular field coil contained in the field coil housing, the electrical output of the



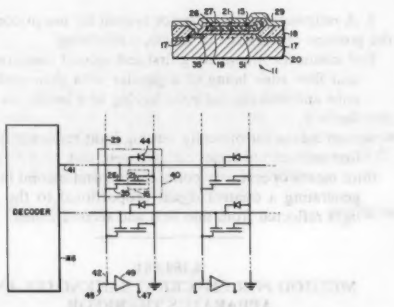
homopolar direct current generator connected to a cathode and anode in an electrolysis cell.

4,184,085

SEMICONDUCTOR MEMORY DEVICE COMPRISING A P-N JUNCTION IN A POLYCRYSTALLINE SEMICONDUCTOR LAYER

Sakari Takahashi, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Jan. 10, 1978, Ser. No. 868,321
Claims priority, application Japan, Jan. 12, 1977, 52/2623
Int. Cl.[2] G11C *11/40*; H01L *27/04*
U.S. Cl. 307—238 **19 Claims**

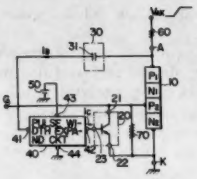


1. A semiconductor memory device comprising a plurality of memory cells, each of said memory cells having a storage capacitor and a transfer gate transistor for charging and discharging said storage capacitor therethrough, said transfer gate transistor including an impurity region of one conductivity type formed in a first surface portion of a semiconductor substrate of the opposite conductivity type, a first insulating film formed on a second surface portion of said substrate adjacent to said first surface portion and a first semiconductor layer of said one conductivity type formed on said first insulating film, said storage capacitor including a second insulating film formed on a third surface portion of said substrate and a second semiconductor layer of said opposite conductivity type formed on said second insulating film and contiguous to said first semiconductor layer.

4,184,086
SEMICONDUCTOR SWITCH

Akio Sagawa; Masayoshi Suzuki, and Tetsuo Ito, all of Hitachi, Japan, assignors to Hitachi, Ltd., Japan

Filed Jul. 5, 1978, Ser. No. 921,951
Claims priority, application Japan, Jul. 13, 1977, 52-82991
Int. Cl.[2] H03K *17/72*
U.S. Cl. 307—252 J 8 Claims



1. A semiconductor switch comprising:

(a) a PNPN switch which has a four-layered structure consisting of a P-type emitter, an N-type base, a P-type base and an N-type emitter and which has at least three PN-junctions,

(b) switching means which has an input terminal, an output terminal and a control terminal,

said input terminal and said output terminal of said switching means being respectively connected to said P-type base and said N-type emitter of said PNPN switch, a path between said P-type base and said N-type emitter of said PNPN switch being electrically short-circuited by a driving signal impressed on said control terminal, and

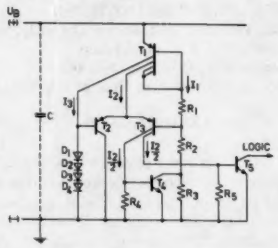
(c) drive means for delivering said driving signal to said control terminal of said switching means,

said drive means detecting a transient state in which a voltage between said P-type emitter and said N-type emitter of said PNPN switch rises abruptly, and delivering said driving signal to said control terminal of said switching means during a period which is longer than a period of said transient state.

4,184,087
WINDOW DISCRIMINATOR OR VOLTAGE RANGE SENSOR

Karl-Diether Nutz, Oedheim, Fed. Rep. of Germany, assignor to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt, Fed. Rep. of Germany

Filed Mar. 29, 1978, Ser. No. 891,404
Claims priority, application Fed. Rep. of Germany, Apr. 7, 1977, 2715609
Int. Cl.[2] H03K *5/153*
U.S. Cl. 307—360 9 Claims



1. A window discriminator circuit for switching the output voltage thereof from a first state to a second state when the voltage of a supply voltage source connected thereto is increased to a first predetermined value, and from said second state back to said first state when said voltage is further increased to a second predetermined value, comprising:

a current source connected to a first terminal of said voltage supply source;

a voltage divider including at least first, secnd and third resistors connected between said current source and a second terminal of said supply voltage source;

a reference voltage source connected between said current source and said second terminal of said supply voltage source;

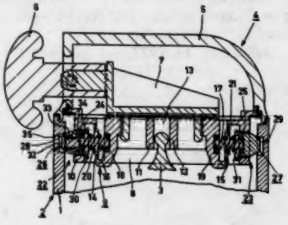
first and second transistors each having base, emitter and collector electrodes, the emitter electrodes of said first and second transistor being coupled to said current source, the base electrode of said first transistor to said reference voltage source, the base electrode of said second transistor between the first and second resistors of said voltage divider, and the collector electrode of said first transistor to said second terminal of said supply voltage source and;

a third transistor having a base electrode connected to a collector electrode of said second transistor, and emitter and collector electrodes connected across the third resistor of said voltage divider, said second transistor being switched on when the voltage of said supply voltage source reaches said first predetermined value and off when said voltage reaches said second predetermined value, said first transistor being switched on when said voltage reaches said second predetermined value.

4,184,088
DETACHABLE HEAD APPLIANCE DRIVEN BY AN ELECTRIC MOTOR

Raymond Richert, Klagenfurt, Austria, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 14, 1977, Ser. No. 842,106
Claims priority, application Austria, Nov. 26, 1976, 8780/76
Int. Cl.[2] H02K *33/00*; B26B *19/04*
U.S. Cl. 310—17 3 Claims



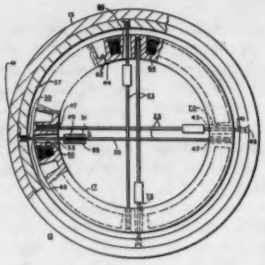
1. An apparatus driven by an electric motor, comprising a basic appliance which includes a drive section, a structural unit with a drivable tool, at least one appliance element which performs a reciprocatory oscillating movement, a spring having one end biassing the appliance element in the direction of the oscillating movement, and a catch means bearing against the other end of the spring and being movable in the direction of the oscillating movement against the action of the spring which engages it for detachably securing the structural unit to the basic appliance.

4,184,089

MULTIPLE PLANE SPOKE STRUCTURE FOR A SUPERCONDUCTING DYNAMOELECTRIC MACHINE

Charles C. Sterrett, Penn Hills Township, Allegheny County, and John H. Murphy, Wilkins Township, Allegheny County, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Feb. 18, 1976, Ser. No. 658,949
Int. Cl.[2] H02K *9/00*
U.S. Cl. 310—52 **9 Claims**



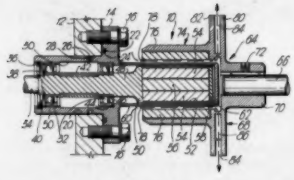
1. In a superconducting dynamoelectric machine having a rotor member including a generally cylindrical first rotor portion adapted for ambient temperature operation, a generally cylindrical second rotor portion adapted for cryogenic temperature operation concentrically disposed within said first rotor portion, said second rotor portion including a rotor core member and a superconducting winding, said winding being wound about said core member with portions of said core member disposed intermediate of next adjacent winding portions, the combination with said core member of a plurality of generally radially extending support spokes interconnecting said first and second rotor portions, said spokes projecting through said intermediate core member portions and being secured in tension between said first and second rotor portions, each of said spokes having one end portion connected to said first rotor portion and the opposite end portion connected to said core member, said spokes being displaced one from another along the axial length of said rotor member.

4,184,090

ROTARY MAGNETIC ISOLATION COUPLING

Patrick M. Taiani, Jollymore, and El-Sayed M. Marzouk, Halifax, both of Canada, assignors to Nova Research Foundation Corporation, Nova Scotia, Canada

Filed Oct. 13, 1977, Ser. No. 841,934
Int. Cl.[2] H02K *49/10*
U.S. Cl. 310—104 **12 Claims**



1. A magnetic drive coupling for a high pressure vessel with an external wall, comprising

a first shaft;

first support means for supporting one end of said first shaft within the vessel;

a first plurality of permanent magnets on the other end of said first shaft, said other end of said first shaft extending through an opening in the vessel exterior wall;

a high pressure gas barrier means of high electrical volume resistivity hermetically sealed to the vessel exterior wall and enveloping said first shaft other end and said first magnets for sealing said first magnets and said first shaft other end within the vessel;

a second shaft aligned with said first shaft;

annular cup-shaped housing means fixed to said second shaft which surrounds and is radially spaced from said gas barrier means;

a second plurality of permanent magnets mounted in said housing means, aligned with said first magnets and radially spaced from said gas barrier means; and

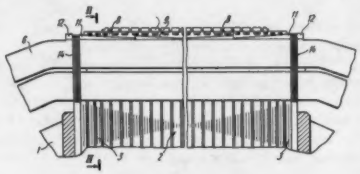
centrifugal blower means fixed to said housing means for drawing air through the space between said second magnets and said gas barrier means to cool said gas barrier means.

4,184,091

ELECTRIC MACHINE STATOR OPPOSITELY DIRECTED SLOTTING WEDGES FOR RETAINING THE WINDING OF AN ELECTRIC MACHINE STATOR

Garry M. Khutoretsky, Altaiskaya ulitsa, 20, kv. 5; Alexandr I. Vorontsov, Pushkin, ulitsa Khazova, 43, kv. 94, and Anatoly D. Ignatiev, ulitsa Basseinaya, 85, kv. 162, all of Leningrad, U.S.S.R.

Filed Dec. 28, 1976, Ser. No. 755,033
Int. Cl.[2] H02K *3/48*
U.S. Cl. 310—214 **2 Claims**



1. In an electric machine stator comprising a core with longitudinal slots for placing therein a winding constituted by bars retained by oppositely directed wedges, the improvement comprising in that peripheral portions of extreme oppositely directed wedges adjoining the winding bars protrude outside the stator core and have cross slots, and a band located in said cross slots which surrounds the stator winding bars.

4,184,092

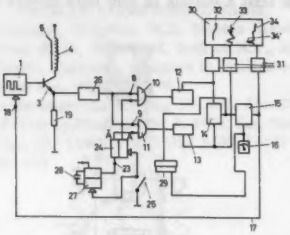
DRIVE CIRCUITS FOR ULTRASONIC TOOTH TREATMENT TRANSDUCERS

Alfred Wieser, Bad Homburg, Fed. Rep. of Germany, assignor to Medtronic GmbH, Fed. Rep. of Germany

Filed Mar. 6, 1978, Ser. No. 883,515
Claims priority, application Fed. Rep. of Germany, Mar. 8, 1977, 2710049
Int. Cl.[2] H01L *41/10*
U.S. Cl. 310—316 **24 Claims**

1. Ultrasonic tooth treatment apparatus having an electromechanical transducer, a generator operable to drive the transducer, the effective output power of said generator being reducible by a control signal, means for deriving a first signal corresponding to the no-load current through the transducer and for deriving a second signal corresponding to the current through the transducer under load, means for comparing the first and the second signal and for providing a sum or difference output signal from said first and second signal, and means

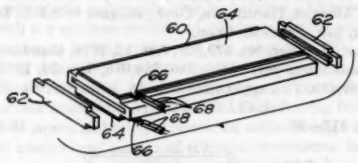
for comparing said output signal with a threshold signal corresponding to a predetermined transducer power and for providing said control signal when said predetermined transducer power is reached.



4,184,093
PIEZOELECTRIC POLYMER RECTANGULAR FLEXURAL PLATE HYDROPHONE

Timothy D. Sullivan, East Haddam, Conn., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jul. 7, 1978, Ser. No. 922,620
Int. Cl.² H01L *41/10*
U.S. Cl. 310—331 **2 Claims**



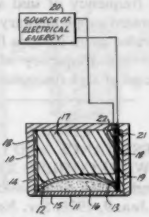
1. A transducer comprising:
a tube having flattened top and bottom surfaces;
a pair of caps with each of said caps connected to respective ends of said tube;
a pair of flexural rectangular plates with one of said plates connected to said top surface of said tube and the other of said plates connected to said bottom surface of said tube;
a pair of rectangular polarized polymer pieces with the most active direction of the polymer transverse to the longitudinal axis of each of said polymer pieces, said polymer pieces each having positive and negative surfaces with respect to each other, the negative surfaces of each of said polymer pieces affixed to respective members of said pair of flexural rectangular plates; and
electrical conductors connected to each of said polymer pieces.

4,184,094
COUPLING FOR A FOCUSED ULTRASONIC TRANSDUCER

LeRoy Kopel, Tempe, Ariz., assignor to Advanced Diagnostic Research Corporation, Tempe, Ariz.

Filed Jun. 1, 1978, Ser. No. 911,524
Int. Cl.² H01L *41/10*
U.S. Cl. 310—335 **16 Claims**

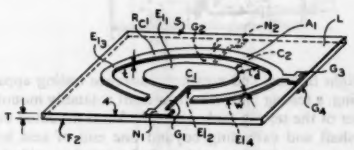
1. A focused ultrasonic transducer comprising:
a piezoelectric crystal having a concave active surface and an acoustical impedance substantially higher than that of water; and
a coupling layer of material filling the concavity of the crystal and forming a flat surface facing away from the concave surface of the crystal, the acoustical impedance of the coupling layer being between that of the crystal and that of water but substantially higher than that of water, and the coupling layer having a sonic velocity near that of water.



4,184,095
QUARTZ CRYSTAL RESONATOR WITH SUPPLEMENTAL ELECTRODES FOR CONTROLLING THE Q FACTOR

Giuseppe Stacchiotti, Milan, and Arturo Bellucci, Vimercate, both of Italy, assignors to Telettra Laboratori de Telefonia Elettronica E Radio S.p.A., Milan, Italy

Filed Apr. 13, 1978, Ser. No. 895,841
Claims priority, application Italy, Apr. 8, 1977, 22268 A/77
Int. Cl.² H01L *41/10*
U.S. Cl. 310—366 **6 Claims**



1. In a quartz crystal resonator of the type comprising an AT type cut quartz plate substantially defined by a pair of opposed surfaces spaced apart by a predetermined quartz thickness, each of said opposed surfaces having at least a main electrode applied thereon, each of said main electrodes at least having a respective active electric field generating portion which is superimposed with respect to the opposed surface main electrode, said active electric field generating portions each having an associated perimetral surface, said main electrodes being connectable to a first electric potential for generating a main electric field in said resonator, said resonator having an associated resonance frequency and Q-factor and associated spurious resonance frequencies; the improvement comprising at least one metallized supplementary control electrode respectively applied to each of said opposed faces and being disposed thereon in surrounding relationship to the perimetral surface of the main electrode active electric field generating portion on said respective opposed face substantially in the form of an aureole, said main electrode being metallized and said opposed surfaces being non-metallized and providing a non-metallized unused portion for said plate over a substantial portion of said opposed surfaces, said supplementary control electrodes each having at least a respective active field generating portion which is superimposed with respect to the opposed surface supplementary control electrode, said suplementary control electrodes being connectable to a second electric potential for generating a supplementary electric field in said resonator, each of said supplementary control electrodes having at least an associated parameter of width, thickness, density, air gap distance from said respective main electrode, and applied second electric potential, each of said main electrodes having at least an associated corresponding parameter of width, thickness, density and applied first electric potential, at least one of

said associated parameters of said supplementary electrodes being different from said corresponding associated parameter for said respective main electrodes for controlling said associated Q-factor and frequency of said spurious resonance frequencies, said generated supplementary electric field cooperating with said generated main electric field for controlling the associated Q-factor and frequency of at least the spurious resonance frequencies of said resonator.

4,184,096

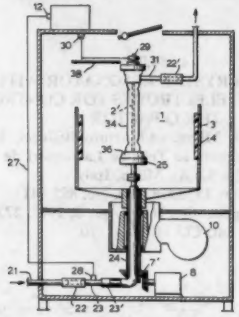
WEATHER RESISTANCE AND LIGHT FASTNESS TESTER WITH COOLED XENON LAMP

Shigeru Suga, Yoyogi 5-20-2, Shibuya-ku, Tokyo, Japan

Filed Jun. 9, 1978, Ser. No. 914,140

Int. Cl.[2] H01J *61/52*

U.S. Cl. 313—17 **4 Claims**



1. A light fastness and weather resistance testing apparatus comprising: a testing tank; a hollow shaft rotatably mounted in the center of the testing tank; a sample frame mounted on said hollow shaft and extending beyond one end of said hollow shaft; means connected to said shaft for rotating said shaft; a tube of electrically conductive metal extending through said hollow shaft and having one end at the space within said sample frame; means connected to the other end of said tube for supplying a cooling liquid to said tube; a xenon lamp in said space within said sample frame and having cooling means mounted thereon, said cooling means having a single wall cylindrical tube of an ultraviolet transmissive glass around said lamp and space therefrom, the low voltage end of said lamp being mounted on said one end of said metal tube and having the low voltage terminal thereof electrically connected to said metal tube, the other end of said glass tube having a drainage tube connected thereto; a high voltage power terminal connected to the high voltage terminal of said lamp; and voltage supply means connected between said other end of said metal tube and said high voltage lamp terminal and including a connecting wire extending outside said sample frame.

4,184,097

INTERNALLY SHIELDED X-RAY TUBE

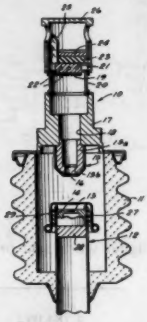
Charles W. Auge, Placentia, Calif., assignor to Magnaflux Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 771,849, Feb. 25, 1977. This application Jun. 9, 1978, Ser. No. 914,166

Int. Cl.[2] H01J *35/08, 35/16*

U.S. Cl. 313—55 **8 Claims**

1. An X-ray tube comprising an evacuated envelope, an X-ray generating target within said envelope, an electron gun positioned within said envelope to direct a stream of electrons at said target, window means arranged to direct the resulting X-rays beyond said envelope, high density attenuating means within said envelope having an axial bore in line with the direction of the electron stream and at least a substantial portion of its axial length extending into the space between said target and said electron gun to attenuate high energy photons not exiting through said window means and a metal having a lower density than said high density attenuating means covering about at least a portion of said high density attenuating



means to reduce the intensity of secondary X-ray emission from said high density attenuating means, said lower density metal having an atomic number less than 40 and a melting point above the operating temperature existing in said tube.

4,184,098

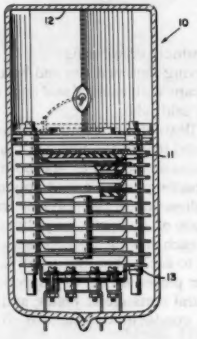
CONE TYPE DYNODE FOR PHOTOMULTIPLIER TUBE

John J. Morales, Huntington, Conn., assignor to S.R.C. Laboratories, Inc., Fairfield, Conn.

Continuation of Ser. No. 679,339, Apr. 22, 1976, abandoned, and a continuation-in-part of Ser. No. 544,016, Jan. 24, 1975, Pat. No. 3,959,680. This application Feb. 15, 1978, Ser. No. 878,031

Int. Cl.[2] H01J *39/14, 43/08*

U.S. Cl. 313—95 **10 Claims**



1. A photomultiplier tube having a single sensing area comprising an electron emitting cathode, an electron collecting anode spaced from the cathode and a plurality of electron multiplying dynodes positioned between the cathode and anode, at least one of said dynodes comprising at least three different size frustums of cones formed of thin metal, means mounting the frustums with their upper and lower edges lying in upper and lower parallel planes and concentric about an axis extending between the cathode and anode and including means electrically interconnecting each frustum to place them all at the same potential and means forming an electron emissive surface on the frustum, in which said one dynode is located to be the dynode nearest the cathode and in which the frustums are diverging to be inclined in a direction outwardly of the axis towards the anode.

4,184,099

COMPOSITION FOR SLOW RELEASE OF VOLATILE INGREDIENTS AT HIGH TEMPERATURE; AND ARTICLE COMPRISING SAME

Jerome I. Lindauer, Hillsdale, N.J.; Marina Munteanu, New York; Sharon Reich, Briarwood, both of N.Y., and Enrique Pelliza, Bogota, Colombia, assignors to International Flavors & Fragrances Inc., New York, N.Y.

Continuation-in-part of Ser. No. 791,403, Apr. 27, 1977, abandoned. This application Jun. 8, 1978, Ser. No. 913,698

Int. Cl.[2] C09F *5/00*; H01J *5/00, 21/00*

U.S. Cl. 313—315 **12 Claims**

1. A co-solvent free, alcohol free thermoplastic polyamide resin body consisting essentially of from 35% up to 70% by weight of said polyamide resin body of a volatile substance selected from the group consisting of perfume oils, insecticides, odorants, bactericides and animal repellents, the remainder of said thermoplastic polyamide resin body being a fatty polyamide which is a reaction product of ethylene diamine and polymeric fat acids at temperatures in the range of 150°–300° C. employing essentially 1 molar equivalent of amine per molar equivalent of carboxyl group, said polymeric fat acids being polymerized monocarboxylic aliphatic acids having from 8 to 24 carbon atoms, and said polymeric fat acids having a dimeric fat acid content and a ratio of trimeric: monomeric fat acids defined substantially within the area ABC of FIG. 5, said fatty polyamide softening in the range of 10°–15° C. on being heated within the range of 120° C. up to 400° C. and having a sharp decrease in viscosity at temperatures above its softening range, said fatty polyamide having a molecular weight within the range between about 9,000 and 12,000, said resin body being a solid solution.

11. The spherical light bulb having fixedly coated thereon a toroid consisting of the thermoplastic polyamide resin body of claim 1.

4,184,100

INDIRECTLY-HEATED CATHODE DEVICE FOR ELECTRON TUBES

Yukio Takanashi, Hiratsuka; Sakae Kimura, Tokyo; Takashi Kuse, Yokohama, and Toshiharu Matsuki, Kawasaki, all of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

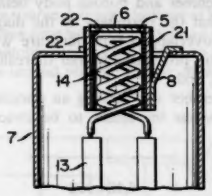
Filed Mar. 22, 1978, Ser. No. 888,993

Claims priority, application Japan, Mar. 29, 1977, 52-33966; Mar. 29, 1977, 52-33967; Aug. 11, 1977, 52-95579; Aug. 11, 1977, 52-95580

Int. Cl.[2] H01J *1/20, 11/14*

U.S. Cl. 313—337 **15 Claims**

1. An indirectly-heated cathode device for electron tubes comprising a hollow cathode sleeve having a thin wall; a base metal having a layer of electron-emitting materials formed on the surface thereof and provided at one end of the sleeve; and a heater disposed within the sleeve for heating the sleeve, the sleeve being made of an alloy consisting essentially of 2 to 35% by weight of chromium, an additive metal selected from the group consisting of cobalt, tungsten, molybdenum, and mixtures thereof, and the balance of nickel, the cobalt content when present ranging from 3 to 30% by weight, the tungsten content when present ranging from 0.5 to 15% by weight, the



molybdenum content when present ranging from 0.5 to 15% by weight.

4,184,101

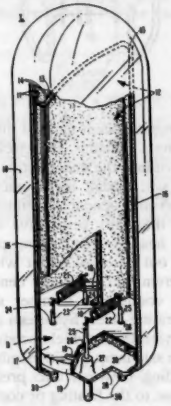
COMPACT FLUORESCENT LAMP HAVING A PARTITIONED ENVELOPE

Robert G. Young, Nutley, N.J., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jul. 11, 1978, Ser. No. 923,526

Int. Cl.[2] H01J *61/10, 61/30, 61/42*

U.S. Cl. 313—485 **12 Claims**



1. In a low-pressure electric discharge lamp having a sealed light-transmitting envelope that contains an ionizable medium, a pair of electrodes, and an inserted partition component which defines a continuous discharge channel of tortuous configuration and has peripheral edge portions that are in abutting relationship with the wall of said envelope, the combination of;

means for preventing the electric discharge from passing through interstitial gaps or crevices along the envelope-partition interface and thus bypassing the partition component comprising substantially flat tab-like members that depend from each of the abutted peripheral edge portions of said partition component and extend laterally therefrom a distance along the envelope wall such that the resulting increase in the arc-traverse dimension of said gaps or crevices is sufficient to prevent the electric discharge from entering and penetrating such gaps or crevices, and

means for preventing the electric discharge from short-circuiting around the end of the partition component and thus bypassing a portion of the tortuous discharge channel comprising a diaphragm assembly that is disposed in abutting engagement with the end of the partition component and extends transversely across the interior of the envelope and contacts the envelope wall,

said diaphragm assembly comprising (a) a porous body of

material and (b) a rigid panel member that is in overlying relationship with said porous body and holds it in place within the envelope,

said panel member and porous body being so shaped and arranged that the periphery of the diaghragm assembly effects an overlapped type juncture with the envelope wall and thus provides a barrier therealong which is arc-impervious, and

said panel member also having an opening therein which permits gaseous impurities to be evacuated from said envelope.

4,184,102

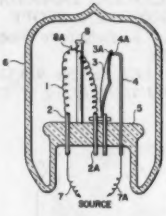
FLASHING AND SOUND GENERATING LAMP

Hiroshi Arai, Tokyo, Japan, assignor to Nippon Lissajou Co., Ltd., Tokyo, Japan

Filed May 5, 1978, Ser. No. 903,303

Int. Cl.[2] H01J *7/44, 17/34, 29/96;* **H01K** *1/62*

U.S. Cl. 315—47 **6 Claims**



1. In a flashing incandescent lamp of the type comprising an envelope containing a filament, and circuit means within the envelope for controlling the energization of the filament in a periodic fashion, said circuit means including an electrical contact and a thermally bendable member disposed adjacent said filament and thermally responsive to the presence and absence of radiant heat from said filament for bending of said member into and out of engagement with said contact, the improvement wherein said thermally bendable member comprises electrically conductive member shaped to exhibit a snap-action temperature-stress hysteresis characteristic operative to generate vibrations which produce a characteristic audible sound from said lamp as said member snaps in opposing directions of bending between two predetermined extreme positions in response to the heating or cooling of said member to two different predetermined temperatures respectively, said thermally bendable member being in engagement with said electrical contact until the temperature of said member is changed to one of said predetermined temperatures, and being thereafter spaced from said electrical contact until the temperature of said member is changed to the other of said predetermined temperatures.

4,184,103

GAS DISCHARGE LAMP BALLAST WITH EQUALLY SPACED WINDINGS

Michael A. Stein, Wayne, N.J., assignor to Universal Manufacturing Corporation, Paterson, N.J.

Filed May 4, 1978, Ser. No. 902,791

Int. Cl.[2] H05B *41/14, 4/36*

U.S. Cl. 315—276 **7 Claims**

1. A lamp ballast circuit for igniting and maintaining illuminated a gas filled lamp comprising:

an input terminal and a common terminal, said terminals being adapted to be connected to a source of AC power;

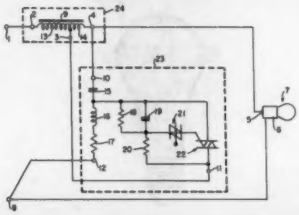
an output terminal, said lamp adapted to be connected between said output terminal and said common terminal;

a tap terminal;

a main inductive winding wound with a predetermined pitch connected between said input terminal and said tap terminal;

an auxiliary inductive winding having substantially fewer turns than said main winding and being wound concentrically therewith with a substantially greater pitch than the main winding, said auxiliary winding being connected between said tap and output terminals, the series combination of said main winding and said auxiliary winding forming a composite autotransformer winding; and

a starter having first, second and third terminals connected to said output, common and tap terminals, respectively,



said starter including enabling means responsive to a voltage between said second and said first terminals for producing an enabling signal when said voltage exceeds a predetermined amplitude, and means responsive to said enabling signal for generating a voltage pulse between said first and third terminals, so that a high amplitude voltage pulse is produced across said lamp as a result of the autotransformer action between said main and auxiliary windings, the serial connection of said windings forming an inductive load in series with said lamp in the absence of said enabling signal.

4,184,104

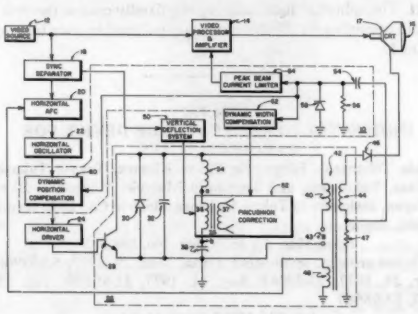
SCAN COMPENSATION CIRCUIT FOR A TELEVISION RECEIVER

John F. Shouse, Jr., Portsmouth, Va., assignor to General Electric Company, Portsmouth, Va.

Filed Nov. 2, 1976, Ser. No. 738,155

Int. Cl.[2] H01J *29/56*

U.S. Cl. 315—371 **8 Claims**



1. In a television receiver including a horizontal sweep system comprising output switch means in circuit with horizontal deflection windings and a flyback transformer having high voltage winding means for developing high voltage for the cathode ray tube of said television receiver, and further including a horizontal oscillator coupled to said output switch means for establishing retrace initiation times for said horizontal sweep system, a scan compensation circuit for correcting raster distortion occasioned by change in picture content between low and high brightness areas such that said cathode ray

tube draws short duration high beam current resulting in loading of said horizontal sweep system, said scan compensation circuit comprising:

means in circuit with said high voltage winding means to develop a reference signal that is a function of instantaneous horizontal sweep system loading, and

position distortion correction means coupled between said output switch means and said horizontal oscillator and responsive to said reference signal to control the timing of application of said horizontal oscillator output to said output switch means such that the initiation of retrace is delayed in accordance with said reference signal.

4,184,105

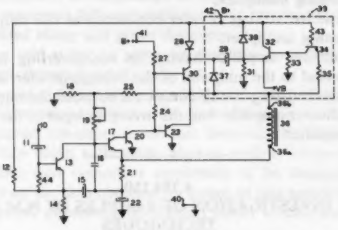
VERTICAL DEFLECTION DRIVE CIRCUIT

Merle D. Skelton, Fort Wayne, Ind., assignor to The Magnavox Company, Fort Wayne, Ind.

Filed Aug. 22, 1977, Ser. No. 826,507

Int. Cl.[2] H01J *29/70, 29/76*

U.S. Cl. 315—397 **5 Claims**



1. Apparatus for vertically deflecting an electron beam in a CRT comprising:

a deflection yoke for generating a magnetic field for vertically displacing said electron beam;

a d.c. voltage source for providing a first d.c. voltage level;

means for providing a second d.c. voltage level from said d.c. voltage source having twice the level of said first d.c. voltage;

a source of vertical oscillator pulses, said pulses defining the beginning and end of a trace period;

means for generating a linearly changing voltage waveform from said first voltage source in response to a vertical oscillator pulse, said voltage waveform having a peak value equivalent to said first d.c. voltage level and a duration equivalent to a trace period;

means for coupling said voltage waveform to said deflection yoke whereby a linerarly changing current will flow through said deflection yoke causing said yoke to deflect said beam across the face of said CRT; and

means for applying said second d.c. voltage level across said deflection yoke at the end of a trace period whereby said beam will be returned to the top of said CRT.

4,184,106

VERTICAL DEFLECTION CIRCUIT FOR A TELEVISION RECEIVER

Gerhard Schaas, Rödental, Fed. Rep. of Germany, assignor to Loewe-Opta GmbH, Kronach, Fed. Rep. of Germany

Filed Jul. 28, 1978, Ser. No. 929,042

Claims priority, application Fed. Rep. of Germany, Aug. 3, 1977, 2734980

Int. Cl.[2] H01J *29/70*

U.S. Cl. 315—403 **10 Claims**

1. A vertical deflection circuit for a television receiver for generating a sawtooth shaped vertical deflection current in the vertical deflection coils of the deflection unit of the picture tube, comprising:

a sawtooth generator synchronized by a vertical oscillator;

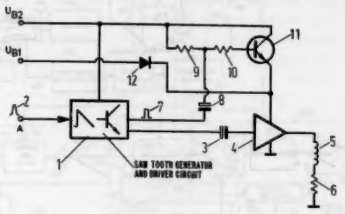
a driver circuit connected to the sawtooth generator;

a linear output amplifier connected to the driver circuit and to the vertical deflection coils;

a first voltage source;

a second voltage source, having a voltage at least resulting in a vertical retrace time within a predefined return time; and

an electronic switching means connected to the first voltage source, to the second voltage source, to the driver circuit



and to the linear output amplifier for switching off the first voltage source, said first voltage source being connected to the output amplifier during the sweep and at the moment of the start of the vertical retrace, and for switching on the second voltage source and applying same to the output amplifier; said switching being controlled by a control signal synchronized with the vertical retrace signal.

4,184,107

CONTROL CIRCUIT FOR A PREDETERMINED ANGULAR MOVEMENT OF A DC MOTOR

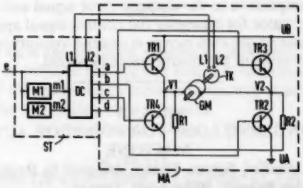
Gerhard Turini, Maisach, and Wolfgang v. Tluck, Olching, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Sep. 28, 1977, Ser. No. 837,583

Claims priority, application Fed. Rep. of Germany, Apr. 13, 1977, 2716411

Int. Cl.[2] G05B *5/01*

U.S. Cl. 318—467 **6 Claims**



1. An apparatus for developing movements of a shaft about a limited angle and employing a DC motor comprising:

first and second position indicators located at spaced-apart angular positions relative to the shaft;

a motor drive having its output coupled to said DC motor to drive the same, means for establishing a direction signal indicative of the direction of rotation of said DC motor;

said position indicators having means for generating output position signals to indicate an incorrect position of said DC motor;

a control circuit;

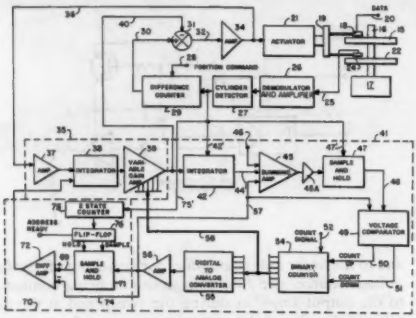
said direction signals and position signals being coupled to said control circuit and the output of the control circuit being coupled to said motor drive; and

said control circuit producing, in response to said signals, an acceleration, deceleration and correction signal, said correction signal being developed for pivotal movement in either pivotal direction only when the shaft is in the region of either one of said first and second position indicators.

4,184,108
SELF-REGULATING ELECTRONIC TACHOMETER

Frank J. Sordello, Los Gatos, and James J. Touchton, Santa Clara, both of Calif., assignors to Sperry Rand Corporation, New York, N.Y.

Filed Nov. 23, 1977, Ser. No. 854,299
Int. Cl.[2] G05B 5/01
U.S. Cl. 318—618 31 Claims



1. In apparatus having a load driven by an actuator for moving the load from a present position to a desired position at desired velocity and including means for receiving an input command signal for driving the load, transducer means coupled to the load for providing a feedback signal indicative of the motion of the load, and means for combining the input command and feedback signals to produce a control signal for application to the actuator to control the load to move at desired velocity, the improvement comprising:

means operatively associated with the load for producing a coarse velocity signal indicative of the velocity of said load,

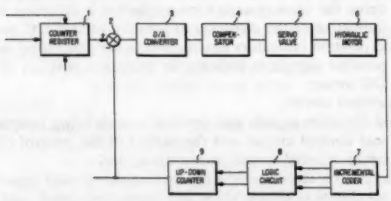
means including a distance indicating integrator coupled to receive the coarse velocity signal for producing a coarse distance signal which is referenced to a distance signal value representative of actual distance traversed to provide a distance error signal indicative of error in the coarse velocity signal, and

means responsive to the distance error signal and coupled to the actuator for changing the control signal applied to the actuator so the load moves at desired velocity irrespective of the error in the coarse velocity signal.

4,184,109
POSITION SERVO LOOP FOR ROBOT OR AUTOMATIC MACHINE

Christian Mauller, Sevres, France, assignor to Regie Nationale des Usines Renault, Billancourt, France

Filed Apr. 27, 1977, Ser. No. 791,402
Claims priority, application France, Apr. 30, 1976, 76 12879
Int. Cl.[2] G05B 6/02
U.S. Cl. 318—622 3 Claims



1. In a position servo loop for a robot or automatic machine, comprising the series connection in the forward path of: a command input, an algebraic comparator, a digital-to-analog converter, a bandwidth-adjusting circuit, a current coil driving the spools of a servovalve controlling the operation of a hydraulic motor making the mechanism of the robot pivot about a given axis, and the series connection in the feedback from the hydraulic motor to the algebraic comparator of: an incremental coder, a logic circuit for detecting the direction of motion about the given axis and an up-down counter the improvement comprising a nonlinear servo compensator connected in the forward path between the digital-to-analog convertor and the current coil driving the spools of the servovalve, the nonlinear servo compensator including a summing operational amplifier for taking the sum of an input signal and its derivative, the amplitude of the latter being tied to the continuous level of the input signal; and wherein the position servo loop includes:

means connected to the inverting input of the summing amplifier for generating the derivative of the input signal, and

means connected to the inverting input of the summing amplifier for transferring the input signal, the derivative generating means including:

an analog multiplier,

a resistive voltage divider connected at the output of the analog multiplier,

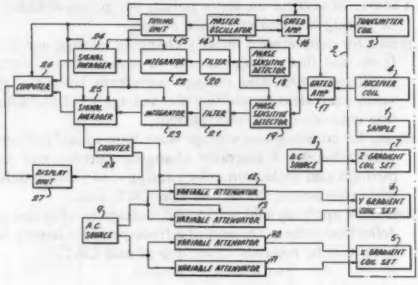
a follower amplifier having its non-inverting input connected to the midpoint of the voltage divider, and

a differentiating circuit connected between the output of the follower amplifier and the inverting input of the summing amplifier.

4,184,110
INVESTIGATION OF SAMPLES BY N.M.R. TECHNIQUES

Waldo S. Hinshaw, Wembley, England, assignor to National Research Development Corporation, London, United Kingdom

Filed May 24, 1978, Ser. No. 909,186
Claims priority, application United Kingdom, May 27, 1977, 22523/77
Int. Cl.[2] G01R 33/08
U.S. Cl. 324—0.5 R 8 Claims



1. A method of investigating a sample, the method comprising:

causing nuclear magnetic resonance of a given nuclear species to occur in said sample by irradiating it with radio frequency energy while subjecting it to a magnetic field, said magnetic field having a systematically varying non-homogeneous component such that said field is substantially invariant with time in a localised volume of said sample but varies with time in all other parts of said sample, said localised volume extending parallel to a given direction and said magnetic field also having a static non-homogeneous component such that within at least part of said localised volume said field, and hence also the resonance frequency for said given species, varies monotoni-

cally with distance in said given direction, and said radio frequency energy being in the form of a train of regularly recurring pulses which are short compared with the intervals between them and which are constituted by intense bursts of oscillation of the same frequency, the characteristics of said pulse train being such that at least part of the frequency spectrum of said radio frequency energy corresponds to at least part of the range of resonance frequencies for said given species within said at least part of said localised volume, that the intervals between said pulses are short compared with the spin-spin relaxation times for at least some of the nuclei of said given species present in said sample, and that in said other parts of said sample there is a significant change between consecutive ones of said intervals in the average value of said magnetic field during one such interval;

receiving from said sample a signal resulting from said nuclear magnetic resonance, said signal containing, by virtue of the manner in which said resonance is caused to occur, substantially continuous wave components whose respective amplitudes are dependent on the amounts of relevant nuclei present in different regions of said localised volume distributed along said given direction;

subjecting said signal to coherent detection to produce at least one detected signal; and

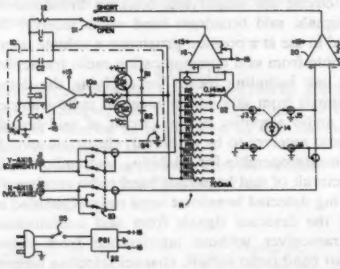
sampling said at least one detected signal during at least one interval between said pulses for each of a series of consecutive equal sub-intervals of that interval, the sampling frequency being sufficiently high to enable information regarding said respective amplitudes to be derived by subjecting the data obtained by means of said sampling to appropriate processing involving Fourier transformation.

4,184,111

DRIVER FOR SOLAR CELL I-V CHARACTERISTIC PLOTS

Alan M. Lovelace, Acting Administrator of the National Aeronautics and Space Administration, with respect to an invention of, and Gary B. Turner, Pasadena, Calif.

Filed Jul. 26, 1978, Ser. No. 928,128
Int. Cl.² G01R 31/24
U.S. Cl. 324—404 **7 Claims**



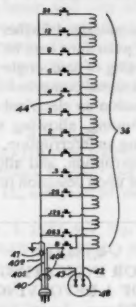
1. An instrument for plotting the current-voltage characteristic of a solar cell under standardized illumination using a Cartesian coordinate system wherein voltage applied to said cell is employed as a voltage control signal for one axis and current conducted through said cell is detected by a resistor in series therewith to produce a voltage control signal for the other axis, said resistor being selected to provide a load line with a slope approximately equal to one and serving the additional purposes of providing a current sensing resistor and setting the full scale current value, whereby said load line will pass through the origin and the approximate center of the plot of current versus voltage with about equal distance from that center to each of the end points.

4,184,112

CAPACITOR TESTING APPARATUS

Elbert W. Cox, P. O. Box 770, The Dalles, Oreg.

Filed Mar. 3, 1978, Ser. No. 883,142
Int. Cl.² G01R 27/26
U.S. Cl. 324—60 C **7 Claims**



1. Capacitor testing apparatus comprising:

(a) a pair of electrical conductors arranged for releasable connection to a source of alternating current,

(b) a plurality of electric coils of differing numbers of turns forming a toroid permitting the removable insertion therethrough of a tong-type ammeter for measurement of current flow through said coils,

(c) a pair of capacitor test leads arranged for releasable connection to a capacitor to be tested, and

(d) an electric switch associated with each coil for releasably connecting said coil and said test leads in series to said pair of electric conductors for connection across a source of alternating current for measuring the capacitance of the test capacitor,

(e) the capacitance, in microfarads, being related to the coils and the source of alternating current by the equation

$$C = \frac{I_m \times 10^6}{2\pi NfE}$$

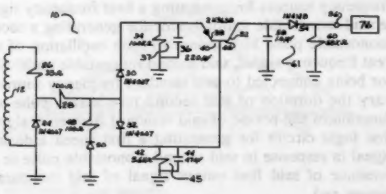
wherein I_m is the ammeter reading in ampheres, N is the number of turns of the applied coil, f is the frequency in Hertz of the alternating current source, and E is the voltage of the alternating current source.

4,184,113

METHOD OF COUNTING ELECTRICAL LOAD CURRENT PULSATIONS

George B. Crouse, Waxhaw, N.C., assignor to Compu-Trol, Inc., Charlotte, N.C.

Filed Nov. 7, 1977, Ser. No. 849,249
Int. Cl.² G01R 19/00, 19/14
U.S. Cl. 324—102 **12 Claims**



1. In an alternating current electrical supply, a method of counting the number of load current pulsations thereof occur-

ring at a lower frequency than the alternating current frequency comprising:

(a) monitoring alternations of said supply current for detecting said pulsations thereof;

(b) creating a discrete signal for each said pulsation in response to said detecting; and

(c) counting said discrete signals to determine the number of said pulsations;

said method being characterized further in that said detecting of a single one of said pulsations may be subjected to interruption during said detecting of said single pulsation, and in that said creating a discrete signal comprises creating at said detecting of said single pulsation an electrical charge at a level in a range suitable for counting, allowing said charge to decay within said range during an interruption, renewing said charge at the end of said interruption, and allowing said charge to decay below said range upon cessation of said detecting of said single pulsation.

4,184,114

ARRANGEMENT FOR INDICATING REVOLUTIONAL SPEED OF A REVOLVING BODY

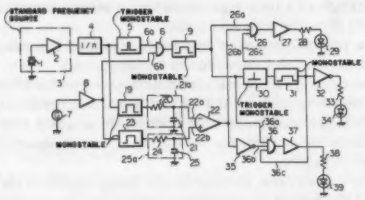
Hiroshi Minakuchi, Kadoma, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Japan

Filed Dec. 23, 1977, Ser. No. 863,957

Claims priority, application Japan, Dec. 24, 1976, 51-156895

Int. Cl.[2] G01P *3/48;* G01R *23/14*

U.S. Cl. 324—161 **5 Claims**



1. A speed tuning aid for a motor comprising:

a standard frequency signal source having a selectable frequency;

a variable frequency signal source for driving said motor;

a first monostable multivibrator for generating a first monostable pulse in response to each oscillation of a variable frequency signal generated by said variable frequency signal source, said first monostable multivibrator being connected to said standard frequency source to vary the duration of said monostable pulse as a function of the period of said standard frequency signal;

a smoothing circuit connected to the output of said first monostable multivibrator for generating a voltage signal having a voltage level proportional to the duration and frequency of said first monostable pulses;

comparator means for generating a first or a second output signal when said voltage signal is higher or lower than a reference voltage, respectively;

a mixing circuit connected to said standard and variable frequency sources for generating a beat frequency signal;

a second monostable multivibrator for generating a second monostable pulse in response to each oscillation of said beat frequency signal, said second monostable multivibrator being connected to said standard frequency source to vary the duration of said second monostable pulse as a function of the period of said standard frequency signal;

a first logic circuit for generating a first speed indicating signal in response to said second monostable pulse in the presence of said first output signal of said comparator means; and

a second logic circuit for generating a second speed indicating signal in response to said second monostable pulse in the presence of said second output signal of said comparator means.

4,184,115

MOBILE CITIZEN BAND TRANSCEIVER CONTROL UNIT WITH AN AUDIO FREQUENCY APPARATUS

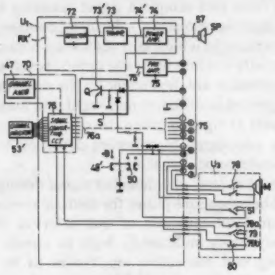
Daisaburo Munakata, and Motomasa Yoshida, both of Toda, Japan, assignors to Clarion Company Limited, Japan

Filed Mar. 25, 1977, Ser. No. 781,479

Claims priority, application Japan, Mar. 26, 1976, 51-35843

Int. Cl.[2] H04B *1/40*

U.S. Cl. 325—25 **3 Claims**



1. A vehicular communication system, comprising:

a communication radio transceiver including transmitter circuitry responsive to channel selection signals for transmitting radio signals on selected channels determined by the channel selection signals, and receiver circuitry responsive to the channel selection signals for receiving and detecting radio signals on selected channels determined by the channel selection signals, said communication transceiver being mounted in use at a position remote from a vehicle operator;

a broadcast band radio receiver having an audio amplifier output circuit for amplifying detected broadcast band radio signals, said broadcast band radio receiver being mounted in use at a position proximate a vehicle operator and remote from said communication radio transceiver;

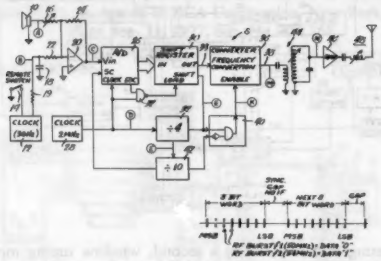
a control unit including means for applying the detected radio signals from said communication radio transceiver to said audio amplifier output circuit of said broadcast band radio receiver to be amplified, electronic switching circuit means operable for inhibiting said audio amplifier output circuit of said broadcast band radio receiver from amplifying detected broadcast band radio signals so as to amplify the detected signals from said communication radio transceiver without interference from detected broadcast band radio signals, channel selecting means for developing the channel selecting signals for selecting the channels on which said communication radio transceiver operates, and channel indicating means for indicating the channel of said communication radio transceiver selected by the channel selection signals, said control unit being mounted in use at a position proximate a vehicle operator and remote from said communication radio transceiver; and

a connecting cable for connecting said control unit and said communication radio transceiver for applyinng channel selection signals from said control unit to said communication radio transceiver and for applying the detected signals from said communication radio transceiver to said control unit.

4,184,116
COMMUNICATION SYSTEM HAVING ANALOG-TO-DIGITAL-TO-ANALOG CONVERSION MEANS

Ernest E. Olson, Mount Prospect, and Marvin J. Kreuser, Schaumburg, both of Ill., assignors to Argos Products Company, Inc., Chicago, Ill.

Filed Apr. 7, 1977, Ser. No. 785,319
Int. Cl.[2] H02B 1/00
U.S. Cl. 325—30 **11 Claims**

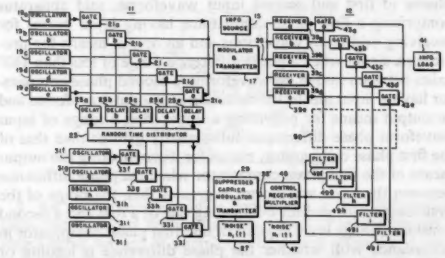


1. A communication system comprising:
means for converting an analog signal into a succession of binary coded words of equal length each word being made up of a series of bits spaced apart from each other by a first established time period, the words being spaced apart from each other by a second established time period greater than said first established time period wherein the succession of binary coded words represents the amplitude of the analog signal;
means for converting the binary coded words into a succession of bursts of energy in serial form, each burst of energy representing a bit of the binary coded word and each burst of energy having either a frequency F0 representing a "0" bit in the word or a frequency F1, representing a "1" bit in the word;
means for transmitting the succession of bursts of energy;
means for receiving the succession of bursts of energy;
means for reconverting the succession of bursts of energy into a succession of received binary coded words; and
means for reconverting the succession of received binary coded words into a signal representative of the analog signal.

4,184,117
COMMUNICATION SECURITY METHOD AND SYSTEM

Herbert G. Lindner, Red Bank, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Apr. 16, 1956, Ser. No. 580,158
Int. Cl.[2] H04K 1/00
U.S. Cl. 325—33 **6 Claims**

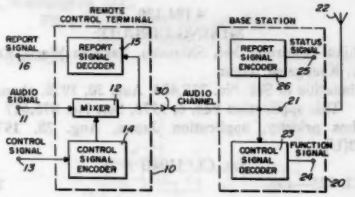


6. A communication security system including a transmitting system having a plurality of sources of carrier frequencies, a source of prescheduled noise, a suppressed carrier modulator and transmitter responsive to said carrier frequencies and to said prescheduled noise for transmitting only the resultant sidebands, and means for connecting said respective carrier sources to said modulator in accordance with a schedule to be communicated, and a receiving system having a synchronized source of identical prescheduled noise, a receiver multiplier responsive to said sidebands and said prescheduled noise to restore said carrier frequencies, and a plurality of filters each corresponding to one carrier frequency, whereby the outputs of said filters reproduce at said receiving system the schedule communicated from said transmitting system.

4,184,118
BASE STATION FEEDBACK REPORTING SYSTEM

Gary A. Cannalte, Hoffman Estates, and David G. Ramsland, Schaumburg, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Oct. 3, 1977, Ser. No. 838,594
Int. Cl.[2] H04B 1/02; H04Q 9/10, 9/12
U.S. Cl. 325—183 **7 Claims**

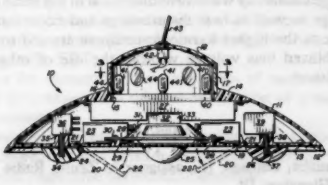


1. In a mobile telephone system, a system for reporting to a control terminal the operational status of a base station equipment being responsive to a control signal sent from the control terminal on an audio channel, the system comprising:
means at the control terminal for sending on the audio channel an encoded control signal of uniform time interval from the control terminal to the base station;
means at the base station for receiving and decoding the encoded control signal to initiate a predetermined base station function;
means for sending to the control terminal from the base station on the audio channel an encoded report signal of uniform time interval indicative of a predetermined operational status of the equipment at the base station; and
means for receiving the encoded report signal at the control terminal.

4,184,119
RADIO EQUIPPED SPACE TOY

Kermit D. Kerruish, Phoenix, Ariz., assignor to Wayne Crieghton Morley, El Toro, Calif.

Filed Apr. 12, 1978, Ser. No. 895,772
Int. Cl.[2] H04B 1/08
U.S. Cl. 325—361 **7 Claims**



1. In a toy flying saucer:
(a) a casing comprising
(i) a dome-shaped housing having a flat bottom wall, and

(ii) a turret upstanding from said housing centrally thereof and including a cylindrical wall and a domed top;

(b) a plurality of angularly spaced windows in said cylindrical wall;

(c) a plurality of electric lamps within said cylindrical wall and controlled by an electronic system causing said lamps to blink on and off at random;

(d) a radio receiver within said dome-shaped housing;

(e) a battery for delivering electricity to said radio receiver and the electronic system for said lamps; and

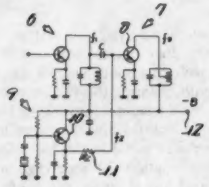
(f) three legs equi-angularly spaced apart and extending below said bottom wall, one of said legs being rotatable and operatively connected to an on/off switch and a volume control for said radio receiver, another of said legs extending through said bottom wall and operatively connected to a tuner for said radio receiver, and an on/off switch depending from the domed top of the turret for controlling the electric system for said lamps and having an operating lever extending above said domed top in simulation of an antenna.

4,184,120

MIXING CIRCUIT

Toshihiko Teshirogi, 344, Shinsaku, Takatsu Ward, Kawasaki City, Kanagawa, Japan

Continuation of Ser. No. 718,454, Aug. 30, 1976, abandoned.
This application Feb. 6, 1978, Ser. No. 875,617
Claims priority, application Japan, Aug. 28, 1975, 50-118483[U]
Int. Cl.[2] H04B *1/28*
U.S. Cl. 325—436 **1 Claim**



1. A mixing circuit comprising:

a high frequency amplifier stage for generating an output with a specified frequency,

a local oscillator stage for generating an output with a specified frequency,

a mixing stage having an input connected to the high frequency amplifier stage, and

a coupling path between the local oscillator stage and the input of the mixing stage comprising a resistor and functioning as a low pass filter in cooperation with stray circuit capacitances to apply a bias voltage and an oscillation output from the local oscillator stage to the input of the mixing stage to inhibit unnecessary higher harmonic components of the oscillation output of the local oscillator stage caused by waveform distortion in the local oscillator stage as well as beat disturbances and noise interference due to the higher harmonic components and to supply a stabilized bias voltage without the use of other biasing resistors.

4,184,121

WIDE WINDOW TUNING SYSTEM

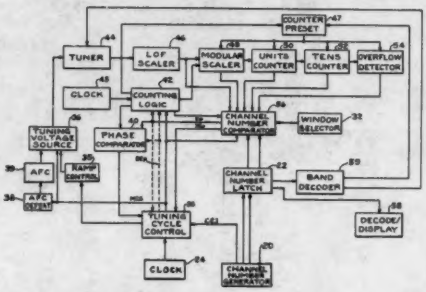
Akio Tanaka, Chicago, Ill., assignor to Zenith Radio Corporation, Glenview, Ill.

Filed Aug. 30, 1976, Ser. No. 718,746
Int. Cl.[2] H04B *1/32;* H04N *5/50*
U.S. Cl. 325—464 **38 Claims**

1. The method of operating a television receiver for receiving any channel band in the television frequency spectrum comprising the steps of:

selecting a desired channel band in said spectrum;

operating said receiver in a first, single frequency tuning mode and initially tuning said receiver to a particular frequency within said selected channel band;



operating said receiver in a second, window tuning mode and establishing a window defining a restricted range of frequencies about said particular frequency; and

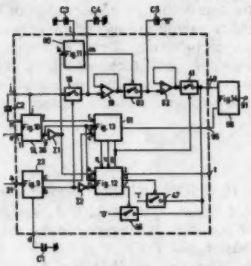
maintaining receiver tuning within said window.

4,184,122

DIGITAL PHASE COMPARISON APPARATUS

Michael A. G. Clark, Crawley Down, and Michael J. Underhill, Faygate, both of England, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 12, 1978, Ser. No. 868,978
Claims priority, application United Kingdom, Jan. 24, 1977, 2743/77
Int. Cl.[2] H03D *3/02;* H03B *3/04*
U.S. Cl. 328—133 **6 Claims**



1. Digital phase comparison apparatus for comparing the phases of first and second input waveforms, said apparatus comprising a first phase comparator having input means for receiving said input waveforms and an output means for providing a signal when a phase difference range of less than 180° exists between said input waveforms; a second phase comparator having input means for receiving said input waveforms and an output means for providing a signal over a range of input waveform phase differences substantially greater than that of the first phase comparator; means for disconnecting the output means of the first phase comparator when the phase difference between the input waveforms is greater than the range of the first comparator and for connecting one of a first and a second constant voltage level in place of said first phase comparator in accordance with whether the phase difference is leading or lagging respectively; means for disconnecting the output means of the second phase comparator when the phase difference is within the range of the first comparator; and means for

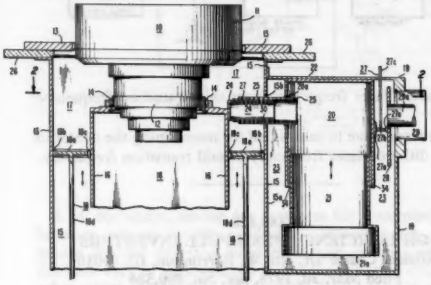
combining one of the output of the first comparator, said first voltage level, and second voltage level with the output of the second comparator such that the combined output characteristic is substantially linear over said range of the second phase comparator.

4,184,123

DOUBLE-TUNED OUTPUT CIRCUIT FOR HIGH POWER DEVICES USING COAXIAL CAVITY RESONATORS

Gerald P. Grill, Ephrata, and Claude E. Doner, New Providence, both of Pa., assignors to RCA Corporation, New York, N.Y.

Filed Sep. 19, 1977, Ser. No. 834,268
Int. Cl.[2] H03F 3/60; H01P 7/04
U.S. Cl. 330—56 **9 Claims**



1. A double tuned output circuit for a high power active device tunable over a given broad band of frequencies comprising:

a primary coaxial cavity resonator having a center conductor coupled to a first terminal of said active device and a coaxial outer conductor coupled to a second terminal of said active device,

a secondary coaxial cavity resonator having a center conductor and an outer conductor,

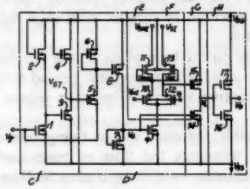
and an adjustable inductive coupling device including an adjustable capacitor connected in series between the center conductors of said first and second resonators for, by adjustment of said series connected capacitor, adjusting the coupling between the primary and secondary resonators to exceed the desired critical coupling to achieve the desired broad band response.

4,184,124

OPERATIONAL AMPLIFIER

Tatsushi Asakawa, Suwa, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Filed Apr. 12, 1977, Ser. No. 786,905
Claims priority, application Japan, Apr. 12, 1976, 51/41031
Int. Cl.[2] H03F 3/18
U.S. Cl. 330—264 **21 Claims**



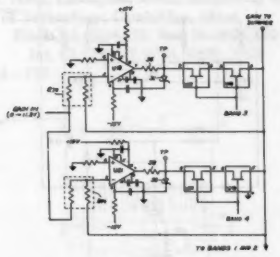
1. An operational amplifier comprising a first differential stage and a second differential stage, each of said differential stages being formed of complementary pairs of insulated gate type field effect transistors having the same conductance characteristics and threshold voltages, said first and second differential stages defining a mirror pair, said first stage providing a first input and said second stage providing a second inverted input, and constant current biasing transistor means formed of an insulated gate type field effect transistor coupled in series to the like polarity transistors of said complementary pairs of insulated gate type field effect transistors in each differential stage, voltage source means coupled to said constant current biasing transistor for applying thereto a standard voltage having a predetermined voltage level, said voltage source means being comprised of at least two like polarity insulated gate field effect transistors having like conductive coefficients and different threshold voltages, said standard voltages applied to said constant biasing transistor means being determined by the difference between the respective threshold voltages of said insulated gate type field effect transistors comprising said voltage source means.

4,184,125

ANALOG TUNING VOLTAGE CIRCUIT WITH ANALOG SIGNAL MULTIPLEXING

James F. Mullally, Apalachin, N.Y., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jul. 7, 1978, Ser. No. 922,601
Int. Cl.[2] H03G 3/00
U.S. Cl. 330—282 **1 Claim**



1. Apparatus having circuit analog signal multiplexing for providing in response to a plurality of sequential respective gate signals a respective plurality of analog tuning voltages that are a determined ratio of a common input voltage comprising:

a. a plurality of operational amplifiers having an inverting input and an output;

b. a plurality of field effect transistor (FET) switches in one-to-one correspondence with the said plurality of operational amplifiers, each having a source connection, a drain connection, and a gate connection;

c. a plurality of first resistors, in one-to-one correspondence with the said plurality of operational amplifiers, each having a first connection and a second connection;

d. a plurality of second resistors in one-to-one correspondence with the said plurality of operational amplifiers, each having a first connection and a second connection;

e. means for connecting the respective said output of each of the operational amplifiers to the said source connection of a respective FET;

f. means for connecting the said drain of each respective FET to a respective said first connection of a respective first resistor;

g. means for connecting the said second connection of the said respective first resistor to the said inverting input of the said respective operational amplifier;

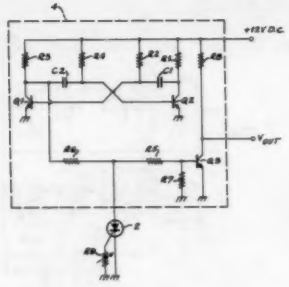
h. means for connecting the first connection of each of the said second resistors to the said input voltage and the said second connection of each respective said second resistors to the said inverting input of a respective operational amplifier;

i. means for connecting the said drain connections of the said plurality of FET switches to a common output;
j. means for applying the said plurality of sequential respective gate signals to the respective gate connections of the respective FET switches whereby in response to a respective gate signal a respective tuning voltage is provided at the said common output that is equivalent to the ratio of the respective first resistor to the said respective second resistor times the said common input voltage; and
k. means including a plurality of Zener diodes in one-to-one correspondence with the said plurality of FET switches for clamping the said source of each of the said plurality of FET switches when the operational amplifier of the respective FET is saturated.

4,184,126
TEMPERATURE SENSITIVE ASTABLE MULTIVIBRATOR

Stanley V. Jaskolski, Sussex; Robert W. Lade, Waukesha; Herman P. Schutten, Elm Grove, and Gordon B. Spellman, Mequon, all of Wis., assignors to Eaton Corporation, Cleveland, Ohio

Filed Sep. 27, 1978, Ser. No. 946,181
Int. Cl.[2] G01K *7/00;* **H03K** *3/282*
U.S. Cl. 331—66 **3 Claims**



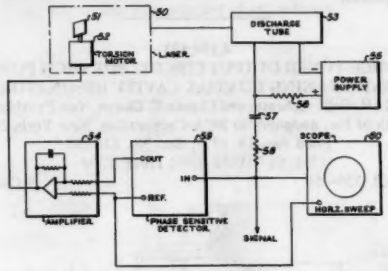
1. A temperature sensitive semiconductor device comprising in combination:
an astable multivibrator having an oscillatory output signal; and
a temperature sensitive thyristor thermally actuatable to intrinsically switch between high and low resistance states in response to a predetermined switching temperature Tsw and electrically connected to said multivibrator such that oscillation of said output signal ceases when the temperature of said thyristor exceeds Tsw.

4,184,127
FREQUENCY STABILIZED LASER

Robert B. Green, Morgantown, W. Va.; Richard A. Keller, White Rock, N. Mex.; Gabriel G. Luther, Gaithersburg, Md.; Peter C. Schenk, Damascus, Md., and John C. Travis, Gaithersburg, Md., assignors to The United States of America as represented by the Secretary of Commerce, Washington, D.C.

Division of Ser. No. 809,334, Jun. 23, 1977, Pat. No. 4,148,586.
This application Nov. 13, 1978, Ser. No. 960,193
Int. Cl.[2] H01S *3/13*
U.S. Cl. 331—94.5 S **1 Claim**

1. A frequency stabilized laser comprising:
an electrically tunable dye or other wide band laser which can be tuned to a selected narrow band of frequencies;
a gas discharge tube arranged to be irradiated by said tunable laser, said discharge tube containing a substance having an electronic transition frequency to which said tunable laser is to be locked;
means for dithering the tuning of said tunable laser;
means for electrically exciting said gas discharge tube to provide an atomic or molecular vapor of said substance and also for providing a signal the amplitude of which is a function of the electrical resistance of said irradiated vapor and therefore of the instantaneous deviation of said

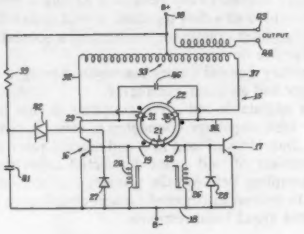


dithered laser frequency from said transition frequency; and
means responsive to said signal for maintaining the center of the dithered laser frequency at said transition frequency.

4,184,128
HIGH EFFICIENCY PUSH-PULL INVERTERS

Ole K. Nilssen, Ceasar Dr. Rte. 4,, Barrington, Ill. 60010

Filed Mar. 20, 1978, Ser. No. 890,586
Int. Cl.[2] H02M *1/18, 7/48;* **H05B** *41/29*
U.S. Cl. 331—113 A **11 Claims**

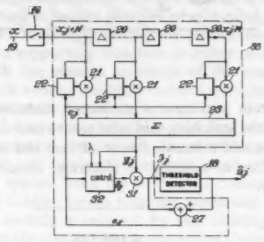


1. In a push-pull inverter circuit connected to a unidirectional voltage input and being operable to provide an alternating voltage output, the inverter circuit comprising a main transformer in circuit with two alternately conducting transistor switching means, each having a base, an emitter and a collector, the improvement which comprises:
separate saturable inductor means that are non-coupled for each said transistor switching means and being connected directly across the base-emitter junction thereof; and
diode means connected in parallel with each said saturable inductor means;
whereby voltage on the base of each said transistor switching means for a predetermined time period serves to saturate the respective saturable inductor means associated therewith;
each said saturable inductor means being operable, when saturated, to terminate the flow of base current for its associated transistor switching means and to provide a path for rapid evacuation of charge carriers stored in the base-emitter junction of said associated transistor switching means to render the latter rapidly non-conductive;
each said diode means serving to provide a drain path for current continuing to flow through its associated saturable inductor means upon said evacuation of charge carriers by the latter.

4,184,129
SYSTEMS FOR TRANSMITTING DATA BETWEEN DISTANT LOCATIONS

Odile Macchi nee Danjon, Orsay; Michel Levy, Massy, and Cesar Macchi, Orsay, all of France, assignors to Agence Nationale de Valorisation de la Recherche (ANVAR), Neuilly-sur-Seine, France

Filed Jun. 3, 1977, Ser. No. 803,245
Claims priority, application France, Jun. 4, 1976, 76 17156
Int. Cl.[2] H04B 1/10, 3/04
U.S. Cl. 333—18 16 Claims



1. A correction device for a system for transmitting data between remote locations using a communication channel whose transfer function includes a main component which does not vary or varies slowly and at least another component whose time constant is substantially lower, and a receiver, comprising, in said receiver:

an equalizing digital filter connected to receive the output from said channel and having a number of taps sufficient for compensating said main component substantially completely and delivering on its output a signal substantially devoid of intersymbol interference,

a digital purely transversal self adaptive network connected to receive the output signal from said equalizing filter, having a number of taps lower than that of said filter and delivering at its output a signal substantially unaffected by said another component,

and a control circuit for at least said network constructed to adapt the tap coefficients thereof, said control circuit having:

first means connected to the output of said self adaptive network and providing an estimated value of the transmitted data,

second means for comparing the output of said self adaptive network and said estimated data and for providing an error signal as a result of said comparison,

and means connected to receive said error signal for adapting the tap coefficients of said self adaptive network according to an adaptive algorithm which is responsive to said error signal.

4,184,130
FILTER DEVICES INCORPORATING DIELECTRIC RESONATORS AND LEAKAGE CABLE

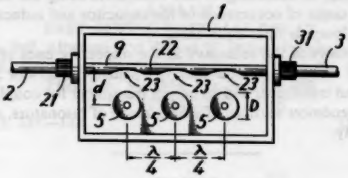
Toshio Nishikawa, Nagaokakyo; Sadahiro Tamura; Youhei Ishikawa, both of Kyoto, and Yoji Ito, Takatsuki, all of Japan, assignors to Murata Manufacturing Co., Ltd., Kyoto, Japan

Filed Jun. 27, 1978, Ser. No. 919,679
Claims priority, application Japan, Jul. 6, 1977, 52/81428
Int. Cl.[2] H03H 9/00; H01P 7/06
U.S. Cl. 333—206 10 Claims

1. A coaxial filter for use with a transmission line for transmission of a high frequency signal, comprising:

a casing made of a conductive material and defining a space, the internal geometry of said space being selected to be in a cut off state with respect to the frequency of said high frequency signal,

a leakage coaxial cable provided in said space of said casing and including an inner conductor and an outer conductor surrounding said inner conductor for transmission of said high frequency signal, said leakage coaxial cable being coupled to said transmission line and having a leakage opening on the outer conductor for allowing for leakage of said high frequency signal, and

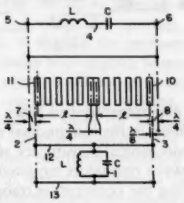


a resonator provided in said space of said casing and operatively coupled to said leakage opening for trapping said leaked high frequency signal.

4,184,131
ELECTRICAL FILTER OF CASCADED SURFACE ACOUSTIC WAVE RESONATORS

Hermann A. Haus, Lexington, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Jul 20, 1978, Ser. No. 926,380
Int. Cl.[2] H03H 9/26, 9/32, 9/02
U.S. Cl. 333—195 2 Claims



1. Surface Acoustic wave filter having a transfer characteristic related to that of any bandpass lumped constant LC filter with a lowpass equivalent comprising

a plurality of surface acoustic wave grating sections, the reflector (groove) center to center spacing of said grating sections are chosen to be one-half wavelength ($\lambda/2$) at the center frequency ω_o of the bandpass filter, the half-length of each grating resonator is determined by

$$l=1/\kappa 1n\{a+\sqrt{a^2+1}\}$$

where

$$a=(\kappa v_g Q/2\omega_o)$$

and κ is the coupling constant of the grating, v_g is the group velocity, and for a bandwidth w in radians/sec

$$Q=Q_C=(\omega_o C)/(wY_o)$$

for each grating resonator corresponding to a capacitor C in each parallel branch of the low pass equivalent; and

$$Q=Q_L=(\omega_o L)/(wZ_o)$$

for each grating resonator corresponding to an inductor L in each series branch of the low pass equivalent,

a cascade of "n" resonators to form a cascade of (n+1)

sections, each section consisting of a uniformly spaced grating of lengths l_1, l_1+l_2, l_2+l_3, . . . , $l_{n-1}+l_n$, l_n; respectively,

said section lengths are selected to provide the nearest integer multiple of reflectors,

n corresponds to the total number of inductors and capacitors in the lumped constant lowpass filter equivalent,

the order of cascading of said resonators being the same as the order of occurrence of the capacitos and inductors in the lowpass filter equivalent,

the centers of the reflectors at the respective ends of adjacent sections are separated by a distance of $\lambda/4$ or $3\ \lambda/4$,

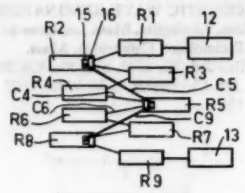
an input transducer and an output transducer for coupling to the endmost sections of said cascade of resonators, respctively.

4,184,132

ELECTROMECHANICAL FILTERS

Philippe M. A. Allemandou, Ablons sur Seine, and Didier M. C. Beaudet, Saint-Maur-des-Fosses, both of France, assignors to Societe Anonyme de Telecommunications, France

Filed Jun. 26, 1978, Ser. No. 918,797
Claims priority, application France, Jul. 1, 1977, 77 20396
Int. Cl.[2] H03H *9/26, 9/02*
U.S. Cl. 333—198 **4 Claims**



1. A pass-band electromechanical filter, comprising a mechanical unit vibrating in the longitudinal mode mounted between two electromechanical transducers, said unit comprising a plurality of half wave resonators mounted in series and coupling rods connecting the consecutive resonators, the resonators being distributed into two groups of which one comprises the resonators of odd rank and the other the resonators of even rank, the filter comprising moreover at least a bridging coupling rod connecting a resonator of rank k to a resonator of rank $k+(2p+1)$ (p being a positive integer different from zero), said bridging coupling rod having its ends fixed at a certain distance from the end faces of the resonators, at least the bridging coupling rod on the one hand, or the coupling rod placed between the resonator of rank k and that of rank $k+(2p+1)$ on the other hand, having a length which is respectively different from a three quarter wave or different from a quarter wave.

4,184,133

ASSEMBLY OF MICROWAVE INTEGRATED CIRCUITS HAVING A STRUCTURALLY CONTINUOUS GROUND PLANE

Richard W. Gehle, Yorba Linda, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Nov. 28, 1977, Ser. No. 855,132
Int. Cl.[2] H01P *3/08*
U.S. Cl. 333—238 **10 Claims**

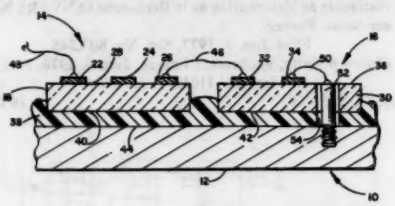
1. A microwave integrated circuit assembly comprising:

a substrate of a first dielectric material, said substrate having an upper surface and a lower surface;

components for microwave integrated circuitry disposed on said upper surface of said substrate;

carrier means for supporting said substrate, said carrier means including means for providing a structurally continuous ground plane for said microwave integrated circuitry;

a layer of a second dielectric material interposed between said lower surface of said substrate and said carrier means,



wherein said second dielectric material is an adhesive material attaching said substrate to said carrier means; and

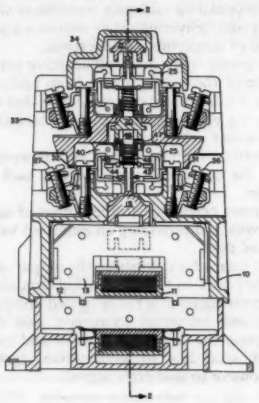
wherein said substrate lower surface and said ground plane are free of conductive electrical connection with each other.

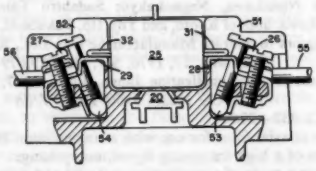
4,184,134

ELECTRICAL SWITCHING APPARATUS HAVING CONVERTIBLE CONTACT STRUCTURE

Hugh Kane, Chagrin Falls, and Bruce A. Oellerich, Mentor, both of Ohio, assignors to Clark Control, Inc., Cleveland, Ohio

Filed Aug. 14, 1978, Ser. No. 933,320
Int. Cl.[2] H01H *1/58*
U.S. Cl. 335—198 **10 Claims**





1. An electrical switching apparatus having a convertible contact module for selectively providing normally open or normally closed contact operation comprising

supporting structure;

a contact actuator mounted in said supporting structure and reciprocally movable with respect thereto;

a convertible contact module having first and second contact terminals on the exterior thereof, said convertible contact module being removably mounted in said supporting structure in engagement with said contact actuator in either of two positions respectively providing normally open and normally closed contact conditions between said contact terminals;

first and second conductive members mounted on said supporting structure, each having a contact region for making contact with a contact terminal of the convertible contact module when the convertible contact module is mounted in the supporting structure in either of said two positions;

holding means for releasably holding the convertible contact module in the supporting structure in either of said two positions with the contact terminals of the convertible contact module making electrical contact with the contact regions of the conductive members; and

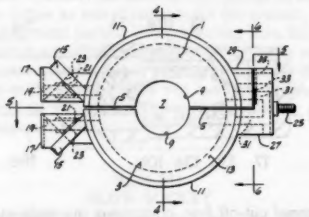
first and second connecting means on said first and second conductive members, respectively, for permitting external connections to said conductive members, each connecting means being spaced from the associated contact region and from the holding means whereby when said convertible contact module is released by said holding means, removed from the supporting structure, and changed from one position to the other, the connecting means and external connections made thereto do not interfere with release and movement of the convertible contact module and are not disturbed.

4,184,135

BREAKAPART SINGLE TURN RF INDUCTION APPARATUS

Kedar P. Gupta, and J. W. Thousand, Jr., both of St. Louis, Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Apr. 10, 1978, Ser. No. 894,884
Int. Cl.[2] H01F *27/28*; H05B *5/08*
U.S. Cl. 336—62 **2 Claims**



1. A breakapart single turn RF induction coil suitable for producing large diameter semiconductor rods and having the capacity for being removed from mounted rods, comprising:

an annular body having two spaced apart sections, said sections having upper and lower surfaces, an outer peripheral surface connecting the respective outer edges of said upper and lower surfaces of the sections and an inner peripheral surface connecting the respective inner edges of said upper and lower surfaces of the sections defining an inner opening of the annular body;

said annular body having an interior forming a hollow chamber for conducting a coolant fluid through said body with the spaced apart section hollow chambers communicating through the connection means;

a slit between the sections and in communication with the annular body inner opening;

connection and ground means at one end of said slit and current receiving means at a second end of said slit; and

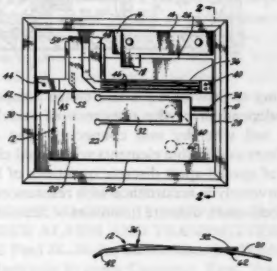
connection and ground means comprised of a first section having a connection and ground end block portion and a second section having a connection and ground end overlapping arm portion, said portions aligned and mated with a tensioning bolt in place in alignment channels of said portions; said portions inclusive of a hollow chamber communication O-ring connection and current carrying connections to the ground means.

4,184,136

FAST ACTING THERMAL RELAY

Lon E. Bell, Altadena, and Robert W. Diller, Pasadena, both of Calif., assignors to Technar, Incorporated, Arcadia, Calif.

Filed Feb. 16, 1978, Ser. No. 878,408
Int. Cl.[2] H01H *61/02, 61/06*
U.S. Cl. 337—141 **12 Claims**



1. A thermally-operated switch apparatus comprising a thin sheet of spring material having an opening forming the sheet into an outer rim encircling the opening, the sheet being crimped at one point to shorten the perimeter of the rim and cause the rim to normally bow slightly in one direction, a thin metal strip secured adjacent either end to said sheet, the strip being positioned to one side of the opening, a bridge member between the strip and the sheet for putting the strip under tension and holding the sheet bowed in the reverse direction from said one direction, electrical resistance means applied to the surface of the strip, means for passing a current through the resistance means to heat the strip and expand its length, permitting the sheet to return to its normal bow in said one direction, the metal strip moving into direct thermal contact with the surface of the sheet over a substantial portion of the length of the strip when the sheet returns to its normal bow, frame means supporting the sheet at only one point along the edge, and electrical switch means including at least one contact carried by the sheet and at least one contact supported on the frame means for making and breaking electrical path as the sheet bows respectively in said one direction and in the reverse direction.

4,184,137

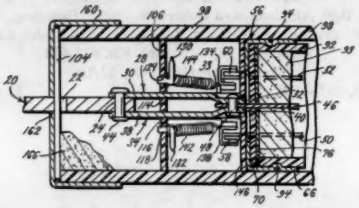
DUAL ELEMENT FUSE PROTECTOR FOR ELECTRIC CIRCUITS

Aldino J. Gaia, and Angelo Urani, both of St. Louis, Mo., assignors to McGraw-Edison Company, Elgin, Ill.

Division of Ser. No. 632,621, Nov. 17, 1975, Pat. No. 4,058,786.
This application Nov. 14, 1977, Ser. No. 851,424
Int. Cl.[2] H01H *85/04, 85/12*
U.S. Cl. 337—161 **5 Claims**

1. An electric fuse which has first and second terminals, a chamber, a plurality of fusible elements disposed within said chamber, a plurality of electrical paths which connect a first end of each of said fusible elements to said first terminals, said electrical paths including spaced-apart discrete quantities of heat-softenable material which can respond to a long-continued potentially-hurtful relatively-low overcurrent to soften and thereby permit individual ones of said electrical paths to become open, a connecting ring disposed adjacent to and

electrically interconnecting said first ends of said fusible elements, said connecting ring and said first ends of said fusible elements having interacting surfaces thereon which enable said connecting ring to fix the spacings between said first ends of said fusible elements, said second terminal electrically interconnecting second ends of each of said fusible elements, whereby said fusible elements are connected in parallel relation with each other between said second terminal and said connecting ring to provide a predetermined composite resistance that is independent of the resistance of said heat-softenable material, and whereby said connecting ring distributes the current, from said fusible elements within said chamber, to said plurality of spaced-apart discrete quantities of heat-softenable material inversely in accordance with resistances of said plurality of spaced-apart, discrete quantities of heat-softenable material.

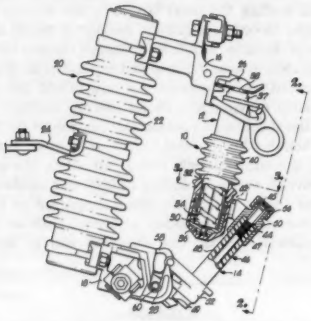


4,184,138

OFFSET, SERIES CONNECTED CURRENT LIMITING FUSE AND EXPULSION FUSEHOLDER ASSEMBLY FOR OPENGATE CUTOUT

Lloyd R. Beard, and Melvin B. Goe, Jr., both of Centralia, Mo., assignors to A. B. Chance Company, Centralia, Mo.

Filed Nov. 25, 1977, Ser. No. 854,738
Int. Cl.[2] H01H *71/10, 71/20*
U.S. Cl. 337—168 **4 Claims**



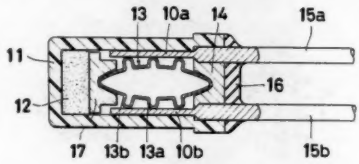
1. An electrical current interrupting device, comprising:
- a pair of electrical terminals for coupling to respective electrical conductors;
- elongated insulator means for supporting said terminals in spaced, electrically insulated relationship to one another;
- a current interrupter for normally bridging and electrically interconnecting said terminals; and
- means for releasably mounting said current interrupter generally between said terminals, and for permitting said interrupter to shift out of said normal bridging position generally between said terminals in response to current flow through the interrupter of a first predetermined magnitude,
- said interrupter including:
  - an expulsion fuse comprising an elongated, tubular fuseholder having at least one gas venting end, and a fuse link within the fuseholder adapted to sever in response to current flow of said first predetermined magnitude;
  - an elongated current limiting fuse adapted to actuate in response to a current flow between said terminals of a second predetermined magnitude greater than said first magnitude;
  - means for electrically interconnecting said current limiting fuse and fuse link in series, and for mechanically connecting the current limiting fuse and fuseholder such that
  - the longitudinal axes of said fuseholder and current limiting fuse are obliquely oriented relative to one another;
  - the longitudinal axis of the fuseholder does not intersect said current limiting fuse;
  - the longitudinal axis of said fuseholder is obliquely oriented relative to the longitudinal axis of said insulator means; and
  - at least a portion of said current limiting fuse is disposed between said insulator means and the corresponding portion of said fuseholder disposed in the central region of said device between said terminals,
- whereby, said corresponding portion of the fuseholder is spaced a maximum distance from said terminals and insulator means and, upon severance of said fuse link, the gases emitted from said venting end are directed obliquely away from said current limiting fuse and insulator means.

4,184,139

THERMAL CUT-OFF FUSE

Kunio Hara, Kawasaki, Japan, assignor to Illinois Tool Works Inc., Chicago, Ill.

Filed Aug. 28, 1978, Ser. No. 937,225
Claims priority, application Japan, Aug. 29, 1977, 52-114521[U]
Int. Cl.[2] H01H *37/76*
U.S. Cl. 337—407 **3 Claims**



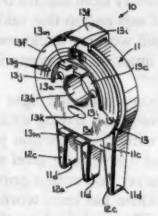
1. A thermal cut-off fuse, comprising in combination
- a housing having a pair of electrodes opposed to each other therein,
- a thermal pellet formulated to melt at a preset temperature and disposed inside the housing, and
- a resilient contactor provided with a plurality of outwardly raised contacts and adapted so that while the thermal pellet retains its solid state, the contactor has its electric continuity retained with the two electrodes by the raised contacts being pressed against the electrodes and, when the thermal pellet, upon reaching the preset temperature, melts into a liquid state and consequently diminishes in volume, the contactor is relieved of the pressure exerted by the pellet and is consequently allowed to resume its original shape by virtue of its own resiliency to break the aforementioned electric continuity,

wherein the raised contact have their heights properly coordinated as by giving to those in the middle a smaller height so that when the contactor is pushed under the pressure exerted by the solid thermal pellet, the contact between the contactor and the electrodes is maintained uniformly at the tips of the raised contacts to ensure reduced contact resistance.

4,184,140
TWO-PIECE TRIMMING POTENTIOMETER

Sydney W. Frey, Jr., and James E. Slagg, both of Brookfield, Wis., assignors to Allen Bradley Company, Milwaukee, Wis.

Filed Dec. 14, 1978, Ser. No. 969,549
Int. Cl.[2] H01C *10/34*
U.S. Cl. 338—174 6 Claims



1. A variable resistor control which comprises:

a base having oppositely facing front and back surfaces and an aperture extending therethrough between the front and back surfaces to form a bearing,

the base also having a track pattern disposed on one of its surfaces which includes

a collector track with an arcuate portion extending along the edge of the aperture, and with a portion extending radially outward from the aperture,

an arcuate resistance track spaced from the arcuate portion of the collector track and having a pair of opposite ends, and

a pair of termination tracks each connected to a respective end of the resistance track, the termination tracks being spaced on opposite sides of the radially extending portion of the collector track; and

a movable contact having a body spaced from the track pattern, an annular flange projecting from the contact body and rotatably mounted in the bearing formed in the base to define an axis of rotation for the contact, a collector engagement surface also projecting from the body of the contact and slidably engaging the collector track, and an arcuate contact finger having its opposite ends connected to the contact body and having a projecting surface formed intermediate its ends and slidably engaging the resistance track.

4,184,141
SLOW SOCKET

Kyung-Cho Chung, 402 Rindge Ave., Cambridge, Mass. 02140

Filed Mar. 20, 1978, Ser. No. 890,585
Int. Cl.[2] H01H *3/02, 1/36, 9/00*
U.S. Cl. 338—219 3 Claims

1. A slow socket switch for installation within the sockets of light bulbs to allow electrical current to build up gradually comprising:

a spring loaded disc rotor in suitable electrical contact with the base of a light bulb socket;

a rotor spring tending to impart a counter-clockwise rotation to said disc rotor;

switch means to cause said spring-mounted disc rotor to rotate about its axis;

a spring loaded notched cam rotatably mounted in the base of said light bulb socket and in suitable electrical contact at its periphery with a resistive lining along the interior wall of said light bulb socket;

said spring loaded notched cam having a parabolic external peripheral edge which is not concentric with the interior sidewall of said lightbulb socket;

said cam spring tending to impart a clockwise rotation to said notched cam, thereby opposing the spring force of said rotor spring;

a rotor arm slidably received at one end in a bearing on said disc rotor and in suitable electrical contact therewith;

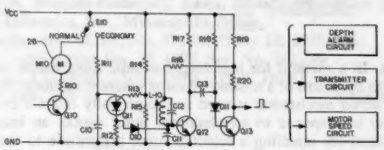
a rotor pin at the opposite end of said rotor arm positioned such that the movement of said rotor pin in an arcuate direction will force the movement of exterior perimeter edge of said notched cam slowly along said resistive lining, thus gradually closing said slow socket switch;

a pair of terminal contact points which define the limits of the fully open and fully closed position of said slow socket switch.

4,184,142
PULSE GENERATING CIRCUIT MEANS FOR DEPTH SOUNDER ALARM AND TRANSMITTER

John Burch, and Paul W. Wells, both of Seattle, Wash., assignors to A-B Electronic Systems Company, Kent, Wash.

Filed Dec. 29, 1977, Ser. No. 865,539
Int. Cl.[2] G01S *9/68, 7/56*
U.S. Cl. 367—112 4 Claims



1. In a flasher type depth sounder device having an echo ranging transmitter and an alarm circuit means, and also including a motor-driven rotary flasher arm, the improvements of a pulse generating and triggering circuit for said transmitter and alarm circuit means, comprising:

(a) switch means for energizing said flasher arm motor in a high power mode and for energizing said triggering circuit in a low power mode when said motor is de-energized,

(b) first subcircuit timing circuit means for producing signals at predetermined time intervals, and

(c) second subcircuit means for receiving said signals from said timing circuit and for generating an output signal for triggering the transmitter and for resetting the alarm circuit of the depth sounder.

4,184,143
SEISMIC SIGNAL CONDUCTOR TESTING SYSTEM

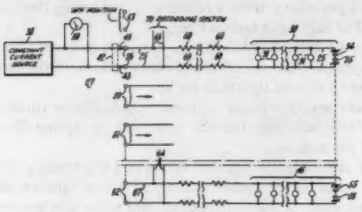
Joseph D. Stafford, Bellaire, Tex., assignor to Texaco Inc., White Plains, N.Y.

Filed Jun. 1, 1978, Ser. No. 911,563
Int. Cl.[2] G01V *1/38;* G01R *31/02*
U.S. Cl. 367—13 8 Claims

1. In combination with seismic exploration wherein at least one very high resistance transducer is connected to a recording station from a transducer station via a signal conductor,

means for testing said signal conductor for continuity without interfering with seismic signals generated by said transducer, comprising

means for providing a conductive path in parallel with said transducer at said transducer station,



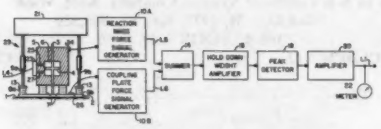
said path being conductive only when a voltage greater than said seismic signals is applied.

4,184,144

MEASUREMENT AND CONTROL OF THE OUTPUT FORCE OF A SEISMIC VIBRATOR

James E. Rickenbacker, Houston, Tex., assignor to Exxon Production Research Company, Houston, Tex.

Filed Nov. 21, 1977, Ser. No. 853,156
Int. Cl.[2] G01V *1/14*
U.S. Cl. 367—137 **19 Claims**



1. In a method for injecting a seismic disturbance into the earth by means of a seismic vibrator wherein an electrohydraulic servo mechanism is used to reciprocally drive a coupling plate in response to an electrical input signal, an improved method for injecting a selected force magnitude to the earth comprising:

generating a signal having an amplitude which substantially follows the peak amplitude of the force imparted to the earth by said coupling plate; and

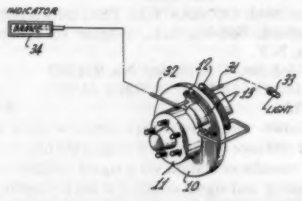
varying the amplitude of the electrical input signal to the vibrator in response to said signal having an amplitude which substantially follows the peak amplitude of the force imparted to the earth so as to achieve said selected force magnitude.

4,184,145

BRAKE APPARATUS USING LIGHT CONDUCTORS TO CONTROL REMOTE WEAR INDICATORS

Raoul G. Fima, Van Nuys, Calif., assignor to Jumpak Products, Inc., Anaheim, Calif.

Filed Aug. 29, 1977, Ser. No. 828,818
Int. Cl.[2] B60Q *1/44*; G08B *21/00*
U.S. Cl. 340—52 A **12 Claims**



1. A disk brake apparatus for a motor vehicle including a rotor connected to a wheel of said vehicle for rotation therewith, a non-rotatable brake shoe connected to the frame of said vehicle and disposed adjacent said rotor, means for moving said brake shoe axially toward said rotor to apply a braking force to said wheel, a friction pad having a flat friction surface subject to wear substantially parallel to said rotor and positioned for engagement therewith, and a plurality of rivets by which said pad is attached to said shoe, said rivets being recessed within said pad away from said friction surface to define a working thickness of said pad so that said rivets can contact said rotor only after said working thickness has been removed by wear, wherein the improvement comprises:

a light source;

at least one continuous elongated light conductor leading from said light sensor and having an intermediate sensor portion recessed within said friction pad and parallel to said rotor to define a severance level at which said rotor will contact and sever said sensor portion after a part of said working thickness has been worn away, said severance level being within said working thickness and closer to said rivets than to said friction surface, thereby defining a reserve thickness between said severance level and said rivets which permits continued wear of said pad beneath said severance level before said rivets contact said rotor; and

display means connected to said light conductor at the end thereof opposite said light source for displaying, at a location remote from said pad and visible to the operator of said vehicle, an indication of the condition of said pad, said display means being responsive to the severance of said sensor portion to effect a change in said indication.

4,184,146

WARNING SYSTEM

Lawrence F. Fratzke, East Peoria, and Joe E. Fuzzell, Peoria, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Apr. 28, 1977, Ser. No. 791,909
Int. Cl.[2] G08B *19/00*
U.S. Cl. 340—52 F **36 Claims**

1. An improvement in a monitor system for an engine-powered vehicle having a battery and a disconnect switch for connecting said battery to the operational circuits of said vehicle, said vehicle having a plurality of monitor devices, each of which is associated with an operating condition of said vehicle, and each of which is capable of affecting an electrical circuit in response to the existence of an undesirable state of the condition with which the monitor device is associated, the improvement comprising:

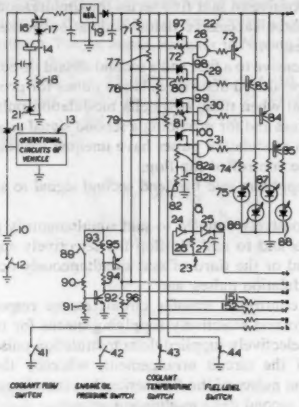
(a) a plurality of electrically energizable warning indicators, each of which is associated with a different one of said monitor devices,

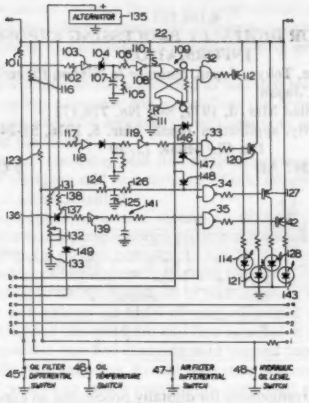
(b) oscillator means having a first operative output during a portion, and a second operative output during a different portion, of each cycle of operation of said oscillator means,

(c) first circuit means operatively associated with a preselected group of said warning indicators and with said oscillator for individually energizing any of said preselected group of indicators in response to an undesirable state condition of the monitor device with which it is associated during, but only during, the first operative outputs of said oscillator means,

(d) second circuit means operatively associated with the remaining of said warning indicators and with said oscilla-

tor for individually energizing any of said remaining indicators in response to an undesirable state condition of the





monitor device during, but only during, the second operative outputs of said oscillator means.

4,184,147

INPUT DEVICE FOR INPUT OF ALPHANUMERIC CHARACTERS INTO A COMPUTER

Hans E. Seelbach, Georgenstrasse 13, Munich, Fed. Rep. of Germany

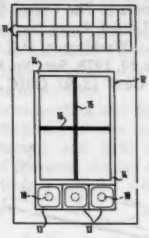
Filed Jan. 9, 1978, Ser. No. 867,882

Claims priority, application Fed. Rep. of Germany, Jan. 12, 1977, 2701115

Int. Cl.[2] G06K *9/00*

U.S. Cl. 340—146.3 SY **15 Claims**

1. A method of producing an output representing a written character, the method comprising the steps of writing each character on an input area with a writing means, generating electric signals in response to the traverse by the writing means of three or more sub-areas of the input and the simultaneous traverse of at least two of said sub-areas, storing the generated signals in the time sequence in which they were generated, comparing said stored signal sequence with predetermined character representing signal sequences, and providing said



output in response to correspondence between said stored signal sequence and one of said predetermined sequences.

4,184,148

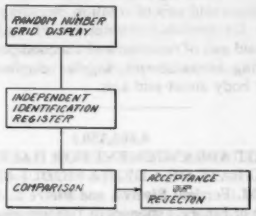
IDENTIFICATION DEVICES AND SYSTEMS

Edward A. Smagala-Romanoff, Edina, Minn., assignor to ID Code Industries, Inc., Minneapolis, Minn.

Continuation of Ser. No. 579,912, May 22, 1975. This application Jan. 25, 1977, Ser. No. 762,299

Int. Cl.[2] B42D *15/02;* **G06K** *19/06;* **H04Q** *9/00*

U.S. Cl. 340—149 A **9 Claims**

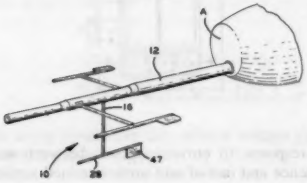


8. A method of performing a personal identity check for security purposes comprising the steps of: first providing each client with a positional code consisting of at least two predetermined positions occupied by digits required for establishing his identity in response to the presentation of any grid of digits; making available for inspection by a person of an alleged identity a grid of digits selected by a representative of a participating location from a multiplicity of different grids each comprising a plurality of each of a number of different digits distributed and arranged so that the position of each digit can be identified in terms of a positional code known to the person of the alleged identity; receiving from the person being checked digits appearing at the positions represented by his positional code in the selected grid; and comparing the given digits for the specific grid with a record in which the positional code of the client of the alleged identity is recorded, together with an independent identification, in terms of the digits appearing on each of the grids at the positions represented by the code previously provided to him.

4,184,149
AIR SPEED AND ATTITUDE PROBE

Gerald J. Baker, Lancaster, and Merle A. Economu, Palmdale, both of Calif., assignors to The United States of America as represented by the United States National Aeronautics and Space Administration, Washington, D.C.

Filed May 30, 1978, Ser. No. 910,708
Int. Cl.[2] G01F *13/02*; G01C *23/00*
U.S. Cl. 340—177 VA 4 Claims



1. In a probe for use in determining local air speed and attitude for an aircraft having mounted thereon a data boom forwardly projected in parallelism with the longitudinal axis of symmetry thereof, a pivot shaft mounted on said boom having a longitudinal axis orthogonally related to the longitudinal axis of the data boom and a flow di. ection vane including a tubular body supported by the shaft for rotation about an axis of rotation coincident with the longitudinal axis of the shaft and characterized by an open-end cavity defining an orifice, a pressure chamber maintained at ambient atmospheric pressure, and a fin mounted on the body for maintaining the open-end cavity in facing relation with relative wind, the improvement comprising:

A. means including a total pressure transducer mounted in the body in communication with the orifice and a static pressure transducer mounted in the body in communication with the pressure chamber;

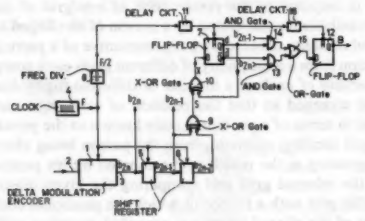
B. circuit means adapted to connect said transducers to a telemetry circuit; and

C. means for detecting angular displacement of said tubular body about said axis of rotation including a first potentiometer for counting revolutions of said tubular body about said axis of rotation, and a second potentiometer for measuring instantaneous angular displacement of said tubular body about said axis.

4,184,150
CIRCUIT ARRANGEMENT FOR HALVING THE SAMPLING RATE OF A DELTA MODULATION SIGNAL

Gilbert M. M. Ferrieu, Bievres, and Pierre L. V. Bréant, Clamart, both of France, assignors to Telecommunications Radioelectriques et Telephoniques TRT, Paris, France

Filed Jul. 18, 1978, Ser. No. 925,779
Claims priority, application France, Aug. 3, 1977, 77 23896
Int. Cl.[2] G06F *5/06*
U.S. Cl. 340—347 DD 3 Claims



1. A circuit arrangement for converting a first series of delta modulation pulses occurring at a rate F, into a second series of delta modulation pulses occurring at a rate F/2, said circuit arrangement comprising:

means responsive to said first series for simultaneously producing three successive delta modulation pulses of said first series;

means responsive to a first and a second of said three simultaneously produced delta modulation pulses for providing a first signal when these two delta modulation pulses have equal values and for providing a second signal when these two delta modulation pulses have unequal values;

a clockpulse controlled flip-flop;

means for applying said first and second signal to said flip-flop;

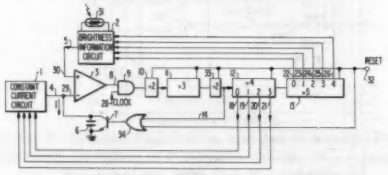
means responsively coupled to said simultaneously producing means and to said flip-flop for selectively supplying the second or the third of said simultaneously occurring delta modulation pulses; and

clockpulse controlled transfer circuit means responsively coupled to said selectively supplying means for transferring the selectively supplied delta modulation pulse to the output of the circuit arrangement, whereby the delta modulation pulses of the first series thus transferred comprise said second delta modulation series.

4,184,151
CIRCUIT FOR DIGITALLY PROCESSING EXPOSURE INFORMATION

Shigehisa Iwata, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Mar. 3, 1977, Ser. No. 774,172
Claims priority, application Japan, Mar. 5, 1976, 51-24530
Int. Cl.[2] H03K *13/20*
U.S. Cl. 340—347 AD 9 Claims



1. A circuit arrangement for digitally processing an exposure control information comprising:

a comparison circuit having two input terminals;

a gate circuit controlled by the output of said comparison circuit to allow passage of a pulse signal of a predetermined frequency;

an N-modulus counter counting output pulses from said gate circuit;

an M-modulus counter counting carry output signals of said N-modulus counter and generating a control signal upon reception of each said carry output signal;

an L-modulus counter counting carry output signals of said M-modulus counter and generating a control signal upon reception of each said carry signal of said M-modulus counter;

a capacitor having one terminal connected to one of said two inputs of said comparison circuit;

a constant-current circuit for charging said capacitor and having the current value thereof changed by said control signal of said M-modulus counter; and

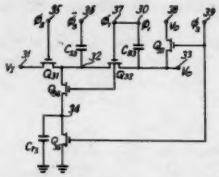
a voltage circuit for generating a scene-brightness information voltage in response to the scene-brightness to supply the other input of said comparison circuit with said information voltage, the value of said voltage being in direct proportion to the scene brightness and being changed by said control signal of said L-modulus counter.

4,184,152

CIRCUIT FOR CONVERTING FROM ANALOG SIGNAL INTO DIGITAL SIGNAL AND VICE VERSA BY USING INSULATED GATE FIELD EFFECT TRANSISTORS

Tojiro Mukawa, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Dec. 27, 1977, Ser. No. 864,450
Claims priority, application Japan, Dec. 27, 1976, 51/156605
Int. Cl.[2] H03K *13/02*
U.S. Cl. 340—347 C 9 Claims



1. A signal converting circuit for converting an analog to a digital signal, said circuit comprising,

a sampling capacitor having first and second terminals for holding a charge to be discharged,

a reference capacitor having first and second terminals for receiving charges from said sampling capacitor, said first terminal of said reference capacitor being grounded;

a first node;

first switching means connected to said first terminal of said sampling capacitor for controlling the conductivity between said first terminal of said sampling capacitor and said first node;

means for rendering said first switching means conductive for charging said first terminal of said sampling capacitor to a given potential;

means connected to said second terminal of said sampling capacitor for impressing a predetermined reference potential and a ground potential to said second terminal;

means including second switching means operatively connected to said first terminal of said sampling capacitor and to said second terminal of said reference capacitor for taking out charges from said first terminal of said sampling capacitor and for charging said second terminal of said reference capacitor to said reference potential;

third switching means operatively connected to said second terminal of said reference capacitor for discharging said reference capacitor to a given potential; and

means operatively connected to said first terminal of said sampling capacitor and to a second node for detecting when the absolute value of the potential at said first terminal of said sampling capacitor is less than the absolute value of said reference potential and for developing a signal at said second node that bears a relation to the inter-terminal voltage across said sampling capacitor wherein an input analog signal is applied to said first node and an output signal corresponding to said input analog signal is derived at said second node.

4,184,153

DISPLAY APPARATUS HAVING A PASSIVE ELECTRO-OPTICAL DISPLAY

Werner Glaubitz, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Sep. 8, 1978, Ser. No. 940,786
Claims priority, application Fed. Rep. of Germany, Oct. 18, 1977, 2746818
Int. Cl.[2] G02F *1/13*
U.S. Cl. 340—765 18 Claims

1. A display apparatus comprising:

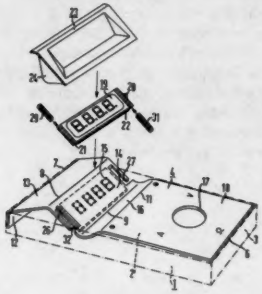
an electro-optical display element including a generally rectangular display area having character display zones and edge-mounted electrical contacts;

a housing including a generally rectangular upwardly open lower part and a cover,

said cover being a fluorescent plate including a first portion which is parallel to said lower part of said housing, and a second portion disposed at an angle to said first portion, and third and fourth portions,

said second portion supporting said display element at said angle and including at least one opening receiving said contacts therethrough and light emergence windows aligned with said character display zones,

said cover comprising a material which has an index of



refraction which is greater than one and contains particles which fluoresce,

said cover including edges and refective material on at least some of said edges,

the transitions of said second portion to the other portions being in accordance with the relationship

$$R \cong (d \cdot n_f)/(n_f - n_a)$$

where R is the exterior radius of curvature, d is the thickness of said cover, n_f is the index of refraction of said cover and n_a is the index of refraction of air and,

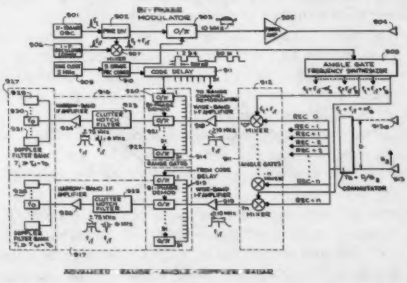
a frame disposed over said display element and secured to said cover.

4,184,154

RANGE AND ANGLE DETERMINING DOPPLER RADAR

Damian F. Albanese, Chatsworth; Henry R. Kennedy, Los Angeles, and Jack W. Goodwin, Canoga Park, all of Calif., assignors to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Jun. 21, 1976, Ser. No. 698,192
Int. Cl.[2] G01S *9/37*
U.S. Cl. 343—9 R 16 Claims



1. A range and angle determining Doppler radar comprising:

first means for generating a CW RF carrier, pseudo-random code generating means, and means for modulating said CW RF carrier with said code and for radiating the resulting signal;

second means including a multi-element antenna array for receiving echo signals corresponding to objects illuminated by said first means;

third means for commutating the elements of said array at a predetermined rate, said third means having a common antenna port, such that each element of said array is connected in succession to said port;

fourth means responsive to signals at said port including a plurality of receiver channels and frequency synthesizer means connected thereto to provide a discrete local oscillator signal to a corresponding mixer in each of said receiver channels, said receiver channels each being thereby discretely tuned to a frequency component representative of an angle in space with respect to said array;

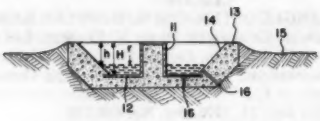
and correlation detection means responsive to each of said receiver channels and to said pseudo-random sequence generated in said first means to provide range determination at each of said angles in space.

4,184,155

RADAR TARGET FOR REMOTELY SENSING HYDROLOGICAL PHENOMENA

Wilford E. Silvertson Jr., Yorktown, Va., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Sep. 22, 1978, Ser. No. 945,041
Int. Cl.[2] G01S 9/60; H01Q 15/00
U.S. Cl. 343—5 CM **11 Claims**



8. Apparatus for measuring the water status at a selected location on the surface of the earth comprising:

a first radar target at said selected location having a radar cross-section area for reflecting signals from a radar;

means included with said first radar target for collecting water and for decreasing its radar cross-section area with an increase in accumulated water;

a second radar target at said selected location having a radar cross-section area that is not changed by water status;

a radar with means for taking images of the area covered by the radar; and

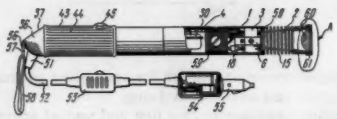
means for moving said radar to a position for taking an image of an area on the surface of the earth that includes said first and second radar targets whereby the relative intensity of the reflected energy from said first and second radar targets as determined by said image is indicative of the water status at said selected location.

4,184,156

DOPPLER RADAR DEVICE FOR MEASURING SPEED OF MOVING OBJECTS

Viktor A. Petrovsky, ulitsa Pugacheva, 19-a, kv. 49; Lev G. Gassanov, ulitsa Uritskogo 25, kv. 65, both of Kiev; Sergei M. Belyaev, ulitsa Magnitogorskaya 3, kv. 97; Lev A. Kochetov, ulitsa Khersonskaya 3, kv. 30, both of Moscow; Vitaly L. Kryzhanovsky, ulitsa Transheinaya 11, kv. 1, Kiev; Andrei A. Palamarchuk, ulitsa Saratovskaya 49, kv. 18, Kiev; Rafail J. Timraleev, ulitsa Levanevskogo 4, kv. 43-2, Kiev; Viktor D. Ushakov, ulitsa D. Bednogo 25, kv. 25, Kiev, and Vitaly M. Parfenjuk, ulitsa Geroev Sevastopolya, 33, kv. 55, Kiev, all of U.S.S.R.

Filed Jul. 27, 1978, Ser. No. 928,451
Claims priority, application U.S.S.R., Jul. 28, 1977, 2534931
Int. Cl.[2] G01S 9/44
U.S. Cl. 343—8 **7 Claims**



1. A Doppler radar device for measuring the speed of moving objects comprising

a casing formed with an elongated tubular section of heat-conducting material;

an antenna arranged in said casing to enable thermal contact therebetween;

a transmitter-receiver unit arranged in said casing behind said antenna along said casing and rigidly coupled with said antenna to enable thermal contact therebetween and said casing;

a data-processing unit arranged in said casing behind said transmitter-receiver unit along said casing to enable thermal contact with said adjacent unit and said casing;

said antenna, transmitter-receiver unit and data-processing unit having the outer periphery shaped to correspond to the inner surface of said casing;

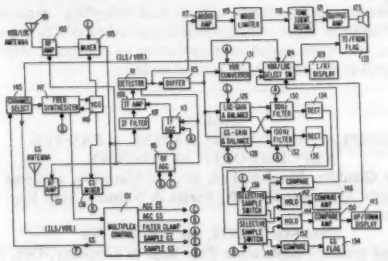
control elements for controlling operation of said device; and a power cable.

4,184,157

IDENTIFICATION TONE RECONSTITUTION IN A TIME SHARED NAVIGATIONAL RECEIVER

Frank P. Smith, 2nd, Dresher, Pa., assignor to Narco Scientific, Inc., Fort Washington, Pa.

Filed Feb. 8, 1978, Ser. No. 876,096
Int. Cl.[2] G01S 1/14
U.S. Cl. 343—108 R **9 Claims**



1. A navigational receiver capable of receiving more than one signal and processing them on a time-shared multiplexed basis for providing simultaneous displays of various navigational information as well as a simultaneous output of station

identification Morse Code signal tones, from at least one station, comprising:

antenna means for receiving said signals including at least one superimposed station identification tone;

front end means including mixer means for preliminarily handling said signals received by said antenna means, said preliminarily handling means being connected to said antenna means;

intermediate signal processing means for time-shared handling of signals received from said front end means;

means, responsive to said intermediate signal processing means, for selectively displaying navigation information wherein navigation information is simultaneously displayed;

audio means, responsive to said intermediate signal processing means for amplifying and passing audio information being at least one superimposed station identification tone received from said intermediate processing means; and

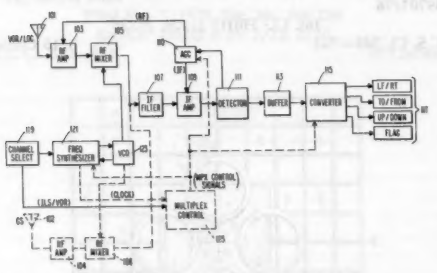
means, responsive to said audio means for reconstituting said superimposed station identification tones, containing discontinuities resulting from time-shared operation of said intermediate signal processing means.

4,184,158

TIME SHARED OPERATION OF NAVIGATIONAL UNIT

Frank P. Smith, 2nd, Dresher, Pa., assignor to Narco Scientific, Inc., Fort Washington, Pa.

Filed Feb. 8, 1978, Ser. No. 876,095
Int. Cl.² G01S *1/14*
U.S. Cl. 343—108 R **13 Claims**



1. In a navigational receiver apparatus having an operator select, an RF amplifier and mixer front end and a voltage controlled oscillator for supplying mixing frequencies thereto wherein a plurality of signals are capable of being alternatively received, as selected by an operator, requiring a plurality of mixing frequencies alternately developed, an improved frequency synthesizer apparatus for supplying a plurality of control voltages to said voltage controlled oscillator, comprising:

means for receiving instructions representative of said plurality of signals alternately received, said receiving means being connected to said operator select;

means, responsive to said receiving means, for developing a plurality of signals, alternately, as a function of said instructions received;

means, responsive to said signal developing means, for providing a plurality of control voltages, alternately, to said voltage controlled oscillator; and

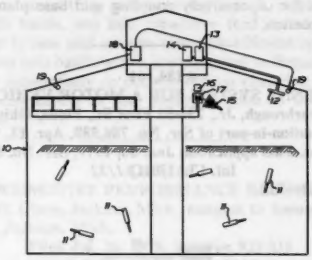
means for providing timing control, the operation of said receiving means, said signal means and said control voltage providing means being controlled from said timing control means.

4,184,159

METHOD AND INSTALLATION FOR TEMPERATURE CONTROL IN A SILO

Sven Å. Andersson, Tyringe, Sweden, assignor to Ingenjorsfirman Nils Weibull AB, Hassleholm, Sweden

Filed Dec. 5, 1977, Ser. No. 857,523
Claims priority, application Sweden, Dec. 8, 1976, 7613784
Int. Cl.² G01S *3/02*
U.S. Cl. 343—112 R **5 Claims**



1. An installation for carrying out temperature control in a silo (10), comprising;

(a) measurement transmitters (11) which are operative, on activation, to transmit a signal related to the ambient temperature of each said transmitter (11), and are intended to be placed at suitable points for temperature control within the silage;

(b) a transmitter (18) for activating the measurement transmitters (11);

(c) a receiver (13) for selectively receiving the signals transmitted by the measurement transmitters; and

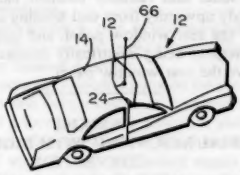
(d) a direction finder (15) for localizing each separate measurement transmitter (11) while each said measurement transmitter (11) is actuated by said transmitter (18) and is transmitting its temperature related signal.

4,184,160

ANTENNA ROOF MOUNT FOR VEHICLES

Victor A. Affronti, 17 Norma La., Kings Park, N.Y. 11754

Filed Mar. 15, 1978, Ser. No. 886,674
Int. Cl.² H01Q *1/32*
U.S. Cl. 343—712 **9 Claims**



1. An antenna roof mount for a vehicle having a roof portion with a thin integral layer of dielectric material existing on the roof portion which serves as the decorative coating of the roof portion, said roof mount comprising:

a base plate for transverse positioning across said roof portion; said base plate being nonconductively attached to said roof portion;

housing means coupled to said base plate, said base plate being substantially wider than said housing means, at least in the area of coupling between said housing means and said base plate, and of sufficient size to provide capacitive

coupling between an antenna and the vehicle to provide a suitable ground connection for the antenna;

antenna means supported by and extending from said housing means; a coaxial cable having an outer conductor connected to said housing means and an inner conductor connected to said antenna; and

mounting means for securing said base plate directly onto said integral dielectric material on the roof portion without any further dielectric material therebetween whereby the integral dielectric material also serves as coupling means for capacatively coupling said base plate to said roof portion.

4,184,161

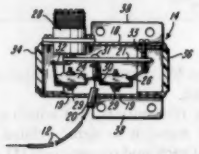
ANTENNA SYSTEM FOR A MOTOR VEHICLE

John D. Scarbrough, Jr., 234-52 First St., Piqua, Ohio 45356

Continuation-in-part of Ser. No. 786,589, Apr. 11, 1977, abandoned. This application Jun. 30, 1977, Ser. No. 811,525

Int. Cl.[2] H01Q *1/32*

U.S. Cl. 343—713 **7 Claims**



1. In combination with a motor vehicle including a metal body surrounding a rear window panel and defining a trunk compartment below the window panel, and a transceiver disposed within the body and capable of functioning within a band of operating frequencies, an improved antenna system for the transceiver, comprising a set of two capacitors closely coupled in series with a common node therebetween, a housing enclosing the series connected capacitors, means within said housing and supporting said capacitors, a coaxial cable having a center electrical conductor connecting one end of the series connected capacitors to the transceiver, means on said housing for electrically connecting the opposite end of said series connected capacitors directly to said vehicle body, means for securing said housing to the vehicle body within the trunk compartment below the rear window panel, an elongated metal radiator element having a fed end and a distal end spaced from said fed end, a resistor connecting said fed end of said radiator element to said series connected capacitors at the common node, said radiator element extending within the vehicle body upwardly from said housing and across the inner surface of the rear window panel, and said distal end of said radiator element being electrically connected to the vehicle body above the rear window panel.

4,184,162

AERIAL MOUNTING WITH RIGHT ANGLE CONNECTION

Joseph Grashow, 4190 Bedford Ave., Brooklyn, N.Y. 11229

Filed Aug. 28, 1978, Ser. No. 937,475

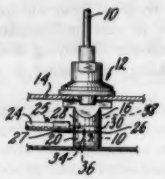
Int. Cl.[2] H01B *17/26*; H01Q *1/50, 1/32*

U.S. Cl. 343—715 **7 Claims**

1. An antenna mounting structure for mounting an antenna on a mounting surface having a limited amount of underspace and attaching a coaxial cable to the antenna comprising:

a base including a means for attaching the base to the mounting surface such that the lower portion thereof is disposed beneath the mounting surface, the antenna being mounted in, but insulated from, the base such that a lower portion of the antenna extends into an interior cavity in the lower portion of the base, an aperture being provided through a side wall of the lower portion of said base to the cavity and being dimensioned such that the inner lead of the coaxial cable can pass therethrough;

cable adaptor means, in the form of a plate with an aperture, for fitting around said lower portion, the outer lead of the coaxial cable being fixed to said plate so that the cable is substantially parallel to the plate at the connection, the inner lead of the coaxial cable extending into the vicinity of the adaptor aperture, the inner lead of the coaxial cable



being dimensioned so that at least a portion of it fits within the base aperture and can make contact with the lower portion of the antenna upon mounting of the plate on the lower portion of the base;

means for securing the inner lead to the lower portion of the antenna; and

means for securing said cable adaptor means to the lower portion of the base thereby mounting the coaxial cable at a right angle to the axial direction of the base.

4,184,163

BROAD BAND, FOUR LOOP ANTENNA

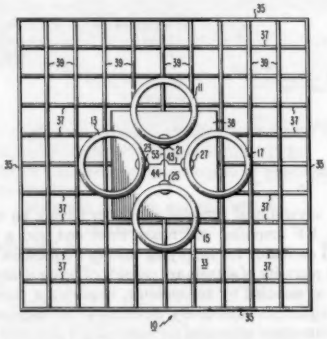
Oakley M. Woodward, Princeton, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Jun. 28, 1977, Ser. No. 810,733

Claims priority, application United Kingdom, Nov. 29, 1976, 49707/76

Int. Cl.[2] H01Q *21/24, 21/26*

U.S. Cl. 343—742 **15 Claims**



1. A broad band antenna comprising:

four symmetrically disposed conductive loops closely spaced from each other and lying generally in a common plane to form a four loop cluster, each of said loops being in the closely spaced electromagnetic coupling region of the adjacent loops along a substantial portion thereof to form a transmission line feeding the portion of the loop at the periphery of the cluster and each of said loops having substantial portions along the periphery of the cluster that diverge in substantially opposite directions with respect to the adjacent loops to form four centers of signal radiation about the periphery of the four loop cluster, and

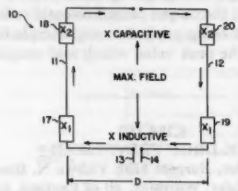
means for feeding the inboard portion of a pair of diagonally opposite loops 180° out of phase.

4,184,164

DIRECTIVE LOOP ANTENNA

Robert L. Rod, Marina Del Rey, Calif., assignor to Monogram Industries, Inc., Santa Monica, Calif.

Filed Dec. 27, 1977, Ser. No. 864,940
Int. Cl.[2] H01Q 7/00
U.S. Cl. 343—744 4 Claims



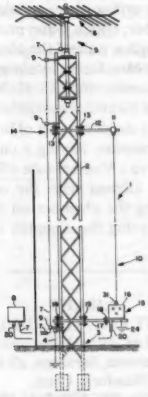
1. A square-loop directive antenna of half wavelength circumference driven at the center of one side and including capacitive reactances in the adjacent sides for a phase shift in the antenna voltage with respect to antenna current of 90° across each of said adjacent sides, wherein said capacitive reactance on each side is divided into two parts, one part situation next to said driven side of the loop and the other part situated next to the side of the loop opposite said driven side, and wherein said one part of capacitive reactance in each side provides a phase shift equal to about 22.5°, and the other part a phase shift equal to about 67.5°.

4,184,165

TUNING SYSTEM FOR TOWER ANTENNAS

Melvin C. Vye, North Canton, Ohio, assignor to Stuart Electronics, Akron, Ohio

Filed Sep. 7, 1978, Ser. No. 940,216
Int. Cl.[2] H01Q 9/34, 1/12, 1/50
U.S. Cl. 343—874 15 Claims



1. A tuning system for enabling an antenna tower as an effective radiator in plural wave length bands in connection with radio equipment having a plural conductor signal carrier for connection with said antenna tower, comprising:

an electrically conductive gamma section vertically parallel to said antenna tower and horizontally spaced therefrom,

connector means for electrically connecting the upper end of said gamma section to said antenna tower at a substantially parallel height location between the top and base of the latter, and

capacitive feed means for shunt connecting said plural conductor signal carrier to said antenna tower and gamma section, including adjustable capacitor means for adjustably matching the input impedance of said antenna tower and gamma section relative to the impedance of said plural conductor signal carrier,

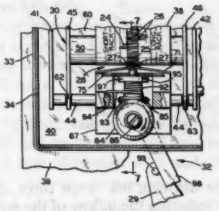
said gamma section having a length shorter than said antenna tower but otherwise independent of antenna tower length and being spaced from said antenna tower for enabling said gamma section and antenna tower to cooperate in transmitting and receiving signals in plural wave length bands, and said capacitive feed means having a range to tune said antenna tower for efficient operation in at least two bands which are separated in frequency by at least substantially an octave without changing the upper end connection of said gamma section to said antenna tower.

4,184,166

LOCOMOTIVE PERFORMANCE RECORDER

Herbert H. Olson, Jackson, Mich., assignor to Aeroquip Corporation, Jackson, Mich.

Filed Jul. 28, 1978, Ser. No. 929,018
Int. Cl.[2] G01D 9/28, 9/36
U.S. Cl. 346—49 11 Claims



1. A recording apparatus for producing a graphic representation representing the operating performance of a railroad locomotive having a diesel engine commanded by a governor, the apparatus comprising:

a. a record paper device including drive means for moving the record paper linearly in proportion to time;

b. means for actuating said drive means; and

c. a recording mechanism for producing the graphic representation upon the record paper by plotting a trace representing actual engine governor balance positions relative to the normal governor balance position, said recording mechanism comprising:

1. means for producing a pair of spaced-apart parallel datum traces on the record paper representing the normal governor balance position;

2. means for producing a second trace on the record paper in relation to said datum traces, said second trace indicating actual governor balance positions; and

3. means operatively connected to the diesel engine for moving said second trace producing means in accordance with the actual governor balance positions of the diesel engine.

4,184,167

INK JET COLLECTION SYSTEM

Casey S. Vandervalk, Mendon, Mass., assignor to Dennison Manufacturing Company, Framingham, Mass.

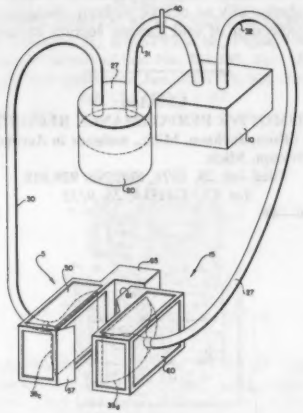
Filed Jul. 3, 1978, Ser. No. 921,672
Int. Cl.[2] G01D 15/18
U.S. Cl. 346—75 9 Claims

1. Improved apparatus for collecting ink drops which have been extracted from a solvent based ink jet of the type including means for selectively charging ink drops in an ink jet having a prescribed path, a deflection electrode to which a poten-

tial difference is applied, thereby creating an electric field in which said selectively charged ink drops are deflected, a collection electrode with a porous inner wall, which together with the porous inner wall of said deflection electrode straddles the path of said ink jet, and a member for intercepting deflected ink drops, appended to the porous inner wall of said collection electrode, in which the improvement comprises:

a receptacle for collecting ink drops, wherein a solvent component of the ink evaporates and mixes with air, forming solvent laden air;

means for routing deflected ink drops from the porous inner wall of said collection electrode to said receptacle;



suction means for drawing ink drops through said routing means, and for inducing the inflow of the solvent laden air from said receptacle;

means for further routing said solvent laden air from said suction means to the porous inner wall of said deflection electrode; and

means for propelling the solvent laden air through said further routing means, whereby the solvent laden air is emitted from the porous inner wall of the deflection electrode.

4,184,168

INK-ON-DEMAND TYPE INK JET HEAD DRIVING CIRCUIT

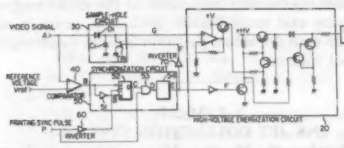
Takuro Isayama, Tokyo, and Tsutomu Sato, Yokohama, both of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Oct. 18, 1978, Ser. No. 952,261

Claims priority, application Japan, Oct. 25, 1977, 52 127805

Int. Cl.[2] G01D *15/18*

U.S. Cl. 346—140 R **4 Claims**



1. An ink-on-demand type ink jet head driving circuit comprising

(a) a comparator for comparing the video signal with a reference voltage and delivering a high-level output when the level of the video signal is higher than or equal to said reference voltage or a low-level output when the level of the video signal is lower than said reference voltage,

(b) a pulse synchronization circuit for receiving the output from said comparator and a printing sync pulse and delivering an output pulse in synchronism with said printing sync pulse only when said pulse synchronization circuit has received said high-level or low-level output from said comparator, and

(c) a sample-hold circuit for holding a peak value of the video signal, the output of said sample-hold circuit being applied to a high-voltage energization circuit for driving an ink jet head, the output pulse from said pulse synchronization circuit being applied to said sample-hold circuit so as to reset the peak value which said smaple-hold circuit holds.

4,184,169

INK-DROP PRINT-HEAD

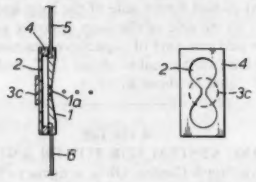
Terrence F. E. Taylor, Burgess Hill; Vishwa N. Bansal, Hove, and Peter T. C. Raby, Worthing, all of England, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Feb. 27, 1978, Ser. No. 881,662

Claims priority, application United Kingdom, Mar. 1, 1977, 08547/77

Int. Cl.[2] G01D *15/16*

U.S. Cl. 346—140 R **3 Claims**



1. A print-head for an on-demand ink drop printer comprising an orifice plate, a back wall and a side wall member which together bound a chamber which has a restriction in the vicinity of the orifice in the orifice plate; an inlet to the chamber; an outlet from the chamber; shock wave producing means effective to produce, through a wall of the chamber, a shock wave in the chamber; and means for maintaining a continuous flow of ink through the chamber such that ink is contained in the orifice with a negative meniscus except when a shock wave is produced whereupon a single droplet of ink is ejected from the orifice, the side wall member having a cutout interior shaped like an hour glass to give a Venturi-tube effect, the constriction being arranged to be aligned with the orifice in the orifice plate, the inlet entering the chamber on one side of the constriction, the outlet leaving the chamber on the other side of the constriction.

4,184,170

LIGHT EMITTING DIODE

Robert D. Burnham, Los Altos Hills; Donald R. Scifres, Los Altos, and Eric G. Rawson, Saratoga, all of Calif., assignors to Xerox Corporation, Stamford, Conn.

Continuation of Ser. No. 786,169, Feb. 11, 1977, abandoned. This application Aug. 25, 1978, Ser. No. 937,010

Int. Cl.[2] H01L *33/00*

U.S. Cl. 357—17 **2 Claims**

1. A light emitting diode capable of having a high switching rate and reduced non-radiative recombination due to tunneling comprising:

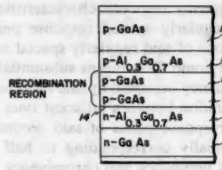
an active recombination region of a first semiconductor material containing group III–V elements,

said active recombination region being bordered by at least one layer of a second semiconductor material containing group III–V elements, said second semiconductor mate-

rial having a lower refractive index than the refractive index of said first semiconductor material,

said active recombination region and said one layer being doped to have opposite conductivity types whereby a rectifying junction is provided therebetween, radiative recombination of oppositely charged carriers taking place in said active recombination region when said rectifying junction is forward biased beyond threshold;

said active recombination region being comprised of a plurality of contiguous layers, one of said layers of said active recombination region being degenerately doped to a level



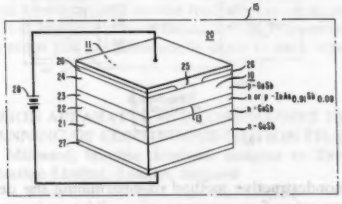
of at least approximately $10^{19}/cm^3$ with a dopant that diffuses readily in both said first material and said second material, said one layer of said active recombination region being separated from said rectifying junction by another of said layers of said active recombination region, said another layer of said active recombination region being less than degenerately doped with a dopant that does not diffuse readily in both said first material and said second material, whereby non-radiative recombination of oppositely charged carriers due to carrier tunneling is reduced.

4,184,171

LIGHT EMITTING DIODES WHICH EMIT IN THE INFRARED

Morton B. Panish, Springfield, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jul. 5, 1978, Ser. No. 921,983
Int. Cl.² H01S *33/19*; H01L *33/00*
U.S. Cl. 357—18 **8 Claims**



1. A semiconductor device for use as a light emitting diode comprising:

a wide bandgap first cladding layer of one conductivity type, a narrower bandgap active region disposed on a major surface of said first layer, and a wider bandgap second cladding layer of opposite conductivity type disposed on said active region characterized in that

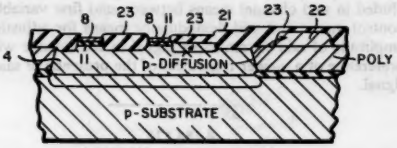
said first and second layers comprise $Al_yGa_{1-y}Sb$ where $0 \leqq y \leqq 1$ and said active region comprises $InAs_xSb_{1-x}$ where $0.82 \leqq x \leqq 0.91$ approximately, said $Al_yGa_{1-y}Sb$ being substantially lattice matched to said $InAs_xSb_{1-x}$.

4,184,172

DIELECTRIC ISOLATION USING SHALLOW OXIDE AND POLYCRYSTALLINE SILICON

Jack I. Raffel, Lexington, and Stephen E. Bernacki, Worcester, both of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Continuation-in-part of Ser. No. 747,743, Dec. 6, 1976, abandoned. This application Feb. 28, 1977, Ser. No. 773,637
Int. Cl.² H01L *27/04*
U.S. Cl. 357—50 **19 Claims**



1. In a semiconductor structure having a plurality of monocrystalline silicon islands in a lateral array, each island being surrounded by a laterally extending isolation structure, and said islands having a plurality of below surface active junctions, at least one below surface active junction in lateral contact with said isolation structure below the silicon surface, the improvement wherein

said isolation structure comprises an upper deep oxide isolating surface layer laterally abutting at least a surface portion of said monocrystalline silicon islands and further abutting along a bottom surface of said oxide layer a lower, thick isolating polycrystalline silicon layer and

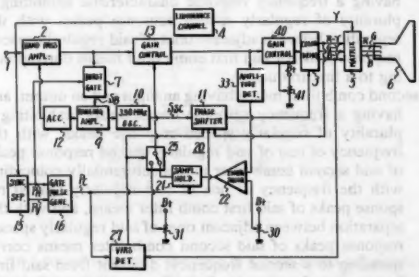
said contact between said junction and said isolation structure is with said oxide layer and said polycrystalline silicon layer is free of contact with said active junctions.

4,184,173

COLOR TELEVISION RECEIVING APPARATUS

Hideshi Tamaru, Sagamihara, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Aug. 19, 1977, Ser. No. 826,200
Claims priority, application Japan, Aug. 23, 1976, 51-100341
Int. Cl.² H04N *9/537*
U.S. Cl. 358—10 **7 Claims**



1. Color television receiving apparatus for receiving a composite color television signal including horizontal and vertical synchronizing signals respectively defining horizontal and vertical scanning intervals, a color burst signal, a luminance signal, and a chrominance signal, the composite color television signal being of the type which may additionally include a VIR signal provided in a predetermined horizontal scanning interval at least certain ones of said vertical scanning intervals, with the VIR signal including a chrominance reference signal; said color television receiving apparatus comprising input means for receiving said chrominance signal and said chromi-

nance reference signal, demodulator means for transforming said chrominance signal into a plurality of color signals, display means for presenting a video picture in response to said color signals, chrominance channel means providing a pathway for said chrominance signal between said input means and said demodulator means, first variable gain control means included in said channel means for controlling the amplitude of said chrominance signal, VIR-signal sensitive means for controlling said first variable gain control means in accordance with the amplitude of said chrominance reference signal, and selectively adjustable second variable gain control means included in said channel means between said first variable gain control means and said demodulator means for adjusting the amplitude of said chrominance signal in accordance with the preference of a viewer regardless of the presence of said VIR signal.

4,184,174

COMB FILTER SYSTEM

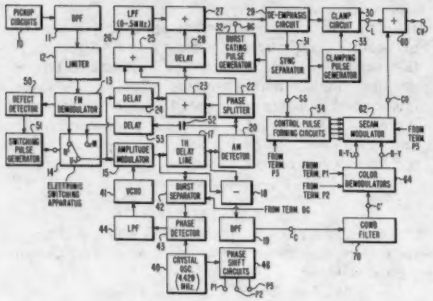
Felix Aschwanden, Thalwil, Switzerland, assignor to RCA Corporation, New York, N.Y.

Filed Jan. 13, 1978, Ser. No. 869,107

Claims priority, application United Kingdom, Jan. 20, 1977, 02374/77

Int. Cl.[2] H04N *9/535*

U.S. Cl. 358—31 **18 Claims**



1. A comb filter system comprising, in combination:

first comb filter means having an input and an output, and having a frequency response characteristic exhibiting a plurality of regularly spaced response peaks, with the separation between adjacent ones of said regularly spaced response peaks of said first comb filter means corresponding to a first frequency;

second comb filter means having an input and an output, and having a frequency response characteristic exhibiting a plurality of regularly spaced response peaks, with the frequency of one of said regularly spaced response peaks of said second comb filter means substantially coinciding with the frequency of one of said regularly spaced response peaks of said first comb filter means, and with the separation between adjacent ones of said regularly spaced response peaks of said second comb filter means corresponding to a second frequency, different from said first frequency; wherein one of said first and second frequencies corresponds to an even integral multiple of the other of said first and second frequencies;

means for coupling the output of said first comb filter means to the input of said second comb filter means; and

means for deriving a filtered version of signals applied to the input of said first comb filter means from the output of said second comb filter means.

8. A signal separation system, for use with composite signals including frequency interleaved luminance and chrominance components, said chrominance component comprising modulated color subcarrier waves; said system comprising:

first comb filter means having an input and an output, and having a frequency response characteristic exhibiting a plurality of regularly spaced response peaks, with the frequency of one of said regularly spaced response peaks of said first comb filter means substantially coinciding with a frequency occupied by said color subcarrier in said composite signals, and with the separation between adjacent ones of said regularly spaced response peaks of said first comb filter means substantially corresponding to the line frequency of said luminance and chrominance components;

means for applying said composite signals to the input of said first comb filter means;

second comb filter means having an input and an output, and having a frequency response characteristic exhibiting a plurality of regularly spaced response peaks, with the frequency of one of said regularly spaced response peaks of said second comb filter means substantially coinciding with said frequency occupied by said color subcarrier, and with the separation between adjacent ones of said regularly spaced response peaks of said second comb filter means substantially corresponding to half the line frequency of said luminance and chrominance components;

means for coupling the output of said first comb filter means to the input of said second comb filter means; and

chrominance component utilization means coupled to the output of said second comb filter means.

4,184,175

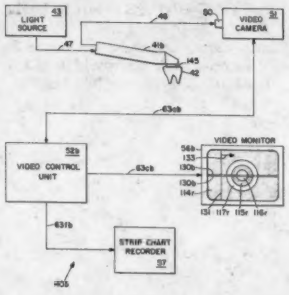
METHOD OF AND APPARATUS FOR OPTICALLY DETECTING ANOMALOUS SUBSURFACE STRUCTURE IN TRANSLUCENT ARTICLES

William I. Mullane, Jr., Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Feb. 9, 1977, Ser. No. 767,008

Int. Cl.[2] H04N *7/18*

U.S. Cl. 358—93 **31 Claims**



1. A nondestructive method of determining the degree of anomalous subsurface structure of a solid translucent article which method comprises the steps of:

illuminating a surface area of said article with a beam of incident light of predetermined intensity;

imposing a predetermined pattern of shaded regions on said incident light beam so that said surface area comprises at least one directly illuminated portion and at least one intervening shaded portion; and

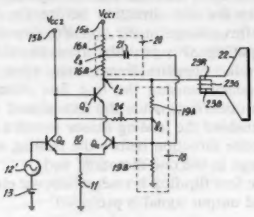
detecting and quantifying the difference between the intensity of subsurface diverted light emanating from subjacent said directly illuminated portion and the intensity of subsurface diverted said light emanating from subjacent a shaded portion.

4,184,176

AMPLIFIER HAVING DIFFERENT LOW-FREQUENCY AND HIGH-FREQUENCY FEEDBACK NETWORKS

Hiroshi Sahara; Yutaka Tanaka, both of Yokohama, and Toshinobu Isobe, Tokyo, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Feb. 2, 1978, Ser. No. 874,614
Claims priority, application Japan, Feb. 16, 1977, 52-15962
Int. Cl.[2] H04N *5/14;* H03F *3/45, 1/34*
U.S. Cl. 358—184 4 Claims



1. A feedback amplifier comprising: amplifying circuit means including input means for receiving an input signal, output means for providing an amplified output signal, first and second transistors each having base, emitter and collector electrodes with said input signal being applied to said base electrode of said first transistor, means for applying operating voltages to the collector electrodes of said transistors, and means for connecting together the emitter electrodes of said transistors to ground, said output means being connected with said collector electrode of the second transistor;

first feedback circuit means connected between said output means and said input means for negatively feeding back a low frequency component of said output signal, said first feedback circuit means including first and second resistors connected in series between said output means and ground, and means connecting a connection point between said first and second resistors to said base electrode of said second transistor; and

second feedback circuit means connected between said output means and said input means for negatively feeding back a high frequency component of said output signal, said second feedback circuit means including third and fourth resistors connected in series to form an output load for said amplifying circuit means, and a capacitor connected between a connection point of said third resistor with said fourth resistor and said base electrode of the second transistor, said second feedback circuit means and said first feedback circuit means having respective feedback ratios that are substantially equal to each other.

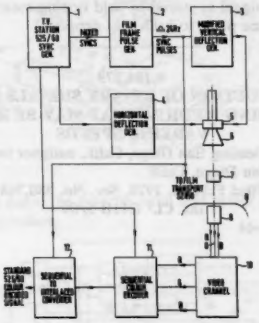
4,184,177

TELEVISION APPARATUS FOR CONSECUTIVE FRAME SCANNING OF CONTINUOUS MOTION FILM

John D. Millward, Hitchin, England, assignor to The Rank Organisation Limited, London, England

Filed Dec. 30, 1977, Ser. No. 865,782
Claims priority, application United Kingdom, Jan. 27, 1977, 3337/77
Int. Cl.[2] H04N *3/36*
U.S. Cl. 358—214 5 Claims

1. In a flying spot telecine apparatus comprising means for driving a cinema film with continuous motion past a scanning position at a film frame rate which is not exactly half the television field frequency, means for optically scanning consecutive frames of the cinema film in raster fashion with a light beam of small cross-section, optoelectronic detector means for converting the picture information thereby modulated on the light beam into electric video signal form, and video processing circuit means for deriving from the electrical video information a television signal comprising consecutive groups of television fields containing picture information derived from scanning respective consecutive film frames, the improvement wherein the scanning means is adapted to make one scan only of each film frame, wherein the video processing circuits comprise a storage arrangement into and from which picture information derived from the said one scans is stored and extracted in a desired sequence for producing the said television signal, and wherein the vertical deflection of the scanning raster, the motion of the film and the operation of the storage arrangement are each synchronised by a common synchronising signal generated at the desired film frame rate.

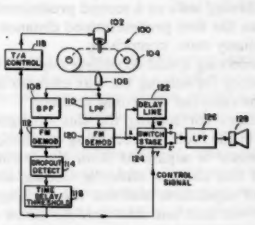


4,184,178

DROP-OUT COMPENSATOR FOR SOUND REPRODUCING APPARATUS DURING TAPE REVERSAL

Gerhard Rotter, Mission Viejo, and Roland H. W. Roos, Orange, both of Calif., assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 419,061, Nov. 26, 1973, abandoned. This application Oct. 29, 1976, Ser. No. 737,145
Claims priority, application Fed. Rep. of Germany, Nov. 30, 1972, 2258608
Int. Cl.[2] G11B *5/02, 15/18*
U.S. Cl. 360—27 12 Claims



1. In a sound system of the type in which audio information carried sequentially on multiple tracks of a magnetic recording tape is played back, via a playback path terminating in sound reproduction means, with the aid of a reversible tape drive including means for scanning said tape, an arrangement for minimizing the audible effect of dropouts in the reproduced audio information which occur incident to each tape reversal, said arrangement comprising:

means for continuously storing a signal varying in dependence on the recorded audio information as it is scanned by said scanning means;

means for generating a control signal indicating the occurrence of each said dropout; and switching means controlled by said control signal and in circuit connection

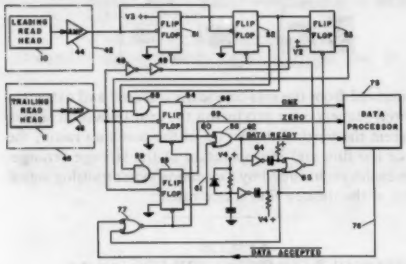
with said playback path, said switching means normally supplying to said reproduction means a first audio signal derived from said scanning means, and said switching means operating in response to said control signal to supply to said sound reproduction means, for the duration of each said dropout, a second audio signal correlated to said varying signal as stored by said storing means a predetermined time prior to each said dropout.

4,184,179

REPRODUCTION OF BINARY SIGNALS FROM A RECORDING MEDIUM THAT MAY BE READ AT VARYING SPEEDS

Chandler R. Deming, San Diego, Calif., assignor to Cubic Western Data, San Diego, Calif.

Filed Feb. 24, 1978, Ser. No. 880,768
Int. Cl.[2] G11B *5/09*
U.S. Cl. 360—44 **16 Claims**



1. A system for reproducing a recorded pulse width modulated binary information signal from a magnetic recording medium in which the signal was recorded by effecting alternating predetermined flux changes in the recording medium, with a flux change in one direction representing a clock pulse and a flux change in the opposite direction representing a data pulse, wherein the distance of separation between the flux changes in one direction is constant and the distance of separation from the flux changes in the one direction to the flux changes in the opposite direction is either a first predetermined distance to represent one binary state or a second predetermined distance that is less than the first predetermined distance to represent the opposite binary state, comprising

means for receiving a said recording medium;

a leading sensor for sensing the flux changes in both directions in the received recording medium;

a trailing sensor for sensing the flux changes in the one direction in the received recording medium, wherein the trailing sensor is separated from the leading sensor to sense said flux changes after the leading sensor and the distance of separation between the trailing and leading sensors is less than said first predetermined distance and more than said second predetermined distance; and

a logic circuit that is responsive to the flux changes in the recording medium being sensed by the leading and trailing sensor for reproducing said binary information signal, wherein the logic circuit comprises

a first flip-flop connected to be continuously enabled and coupled to the leading sensor for being clocked in response to a said flux change in the one direction being sensed by the leading sensor;

a second flip-flop coupled to the first flip-flop for being enabled in response to the first flip-flop being clocked, and coupled to the trailing sensor for being clocked in response to a said flux change in the one direction subsequently being sensed by the tailing sensor;

a third flip-flop coupled to the first flip-flop for being enabled in response to the first flip-flop being clocked, and coupled to the leading sensor for being clocked in response to a said flux change in the opposite direction subsequently being sensed by the leading sensor; and

a gate coupled to the second and third flip-flop outputs for resetting the first flip-flop in response to either of the second and third flip-flops being enabled and subsequently clocked;

wherein a first output signal is provided from the second flip-flop output to represent the one binary state when following the leading sensor sensing the first flux change in the one direction occurring while the second and third flip-flops are not enabled, the trailing sensor senses a flux change in the one direction before the leading sensor senses a flux change in the opposite direction; and a second output signal is provided from the third flip-flop to represent the opposite binary state when following the leading sensor sensing the first flux change in the one direction occurring while the second and third flip-flops are not enabled the leading sensor senses a flux change in the opposite direction before the trailing sensor senses a flux change in the one direction; and

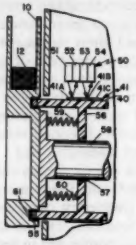
wherein the first flip-flop is reset whenever either a said first or second output signal is provided.

4,184,180

FILE PROTECT AND AMOUNT OF TAPE SENSING APPARATUS

William M. Barton, Jr., San Diego, and Martin D. Gray, La Jolla, both of Calif., assignors to Cipher Data Products, Incorporated, San Diego, Calif.

Filed Sep. 18, 1978, Ser. No. 943,059
Int. Cl.[2] G11B *15/04, 15/18*
U.S. Cl. 360—60 **9 Claims**



1. Apparatus for sensing the presence or absence of a file protect ring on a tape reel, and for subsequently keeping track of the amount of tape contained on said reel comprising:

a cylindrical shaped surface that synchronously rotates with said tape reel;

reflective material on said surface patterned to form first, second, and third tracks of bits running parallel to each other around said surface;

first and second light emitting means spaced from each other by the distance between centers of said tracks and overlying said surface for transmitting light to receive ones of said tracks aligned thereunder;

means for aligning said first and second tracks respectively with said first and second light emitting means when said file protect ring is in said reel, and for aligning said second and third tracks respectively with said first and second light emitting means when said file protect ring is not in said reel;

means for converting the portion of said transmitted light that is reflected from said aligned tracks into a pair of logic signals representative thereof;

means for setting a bit, in response to said logic signals that are generated when said tape is moving in a predetermined direction, as an indicator of whether said light emitting means are aligned with said first and second tracks or said second and third tracks, and

means for counting selectively up or down in response to both said logic signals and said bit to indicate the amount of tape that is unwound from or wound onto said tape reel subsequent to the setting of said bit.

4,184,181

METHOD AND DEVICE FOR TRACKING VIDEO SIGNALS ON A MAGNETIC TAPE BY DETECTING PHASE JUMPS

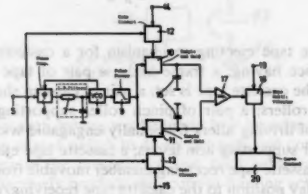
Ljubivoje Mijatovic, Nuremberg, Fed. Rep. of Germany, assignor to Grundig E. M. V. Elektro-Mechanische Versuchsanstalt Max Grundig, Fuerth/Bay, Fed. Rep. of Germany

Filed May 5, 1978, Ser. No. 903,219

Claims priority, application Fed. Rep. of Germany, Jul. 28, 1977, 2734007

Int. Cl.[2] G11B *15/52, 27/30*

U.S. Cl. 360—77 **7 Claims**



1. A device for adjusting the exact position of the track when replaying video signals which are recorded in oblique parallel tracks on a magnetic tape, said oblique tracks being alternately recorded and replayed by two rotating heads, the gaps of which have opposite equal azimuth angles causing phase jumps of the line frequency of the scanned video signal during track changes in case of mistracking, said device including means for detecting said phase jumps, and means for applying said phase jumps to said rotating heads to readjust the rotating video heads to the exact track position by control of the tape speed.

4,184,182

CONTROL MECHANISM FOR THE MOVEMENTS OF A TAPE CASSETTE IN A TAPE CASSETTE RECORDER

Giovanni Santoro, Rome, Italy, assignor to Werbetronic A.G., Mauren, Liechtenstein

Filed May 24, 1978, Ser. No. 909,021

Claims priority, application Italy, May 26, 1977, 49577 A/77

Int. Cl.[2] G11B *15/24, 15/18*

U.S. Cl. 360—96.6 **10 Claims**

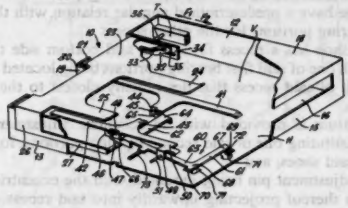
7. In a cassette tape recorder including a housing for receiving a cassette and driving means mounted on said housing,

a control mechanism for moving a cassette between an upper introduction and expulsion position and a lower play position, comprising:

a first support member having a first end pivotally connected to said housing and a second free end;

a second support member adapted to supportively engage a cassette and being pivotally supportively mounted to said second free end of said first support member; and

a control lever pivotally mounted to said housing, said control lever having a first arm extending above said second support member and adapted to contact the top of a cassette to downwardly force the cassette from said upper position to said lower position, and a second arm extending below said first support member and adapted to upwardly force the cassette from said lower position to said upper position.



4,184,183

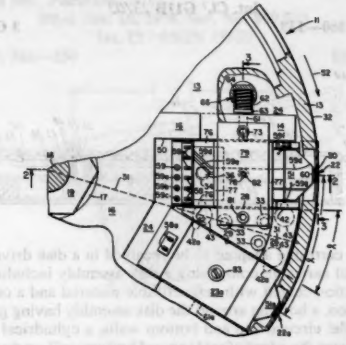
FIELD REPLACEABLE HEADS FOR MAGNETIC TAPE MACHINE

Dale P. Dolby, Los Altos, Calif., assignor to Ampex Corporation, Redwood City, Calif.

Filed Apr. 7, 1978, Ser. No. 894,309

Int. Cl.[2] G11B *5/56, 21/24*

U.S. Cl. 360—107 **10 Claims**



1. A magnetic recording-reproducing machine of the type including means for positioning a magnetic recording medium in a predetermined position on said machine, and at least the magnetic transducing heads positioned on said machine in a desired transducing relation with said recording medium in said predetermined position thereof, characterized in that:

each of said transducing heads is mounted in a shoe member having at least three first bearing portions facing in different directions and having a first predetermined dimensional relationship with one another and with said head;

said machine is provided with at least three second bearing portions for each shoe member respectively engaging said first bearing portions of the corresponding shoe member in a predetermined mating relationship further defined as comprising a second predetermined dimensional relationship of said second bearing portions with one another and with said recording medium positioning means, for thereby positioning said corresponding shoe with said head thereof in said desired transducing relation with said recording medium;

means are provided for holding said corresponding shoe member on said machine with said first and second bearing portions in said predetermined mating relationship;

said positioning means includes a cylindrical guide having a peripheral tape guiding surface and guide means for guiding said magnetic recording medium in the form of a tape

in a helical path around said cylindrical guide, and said heads and the respective shoes therefor are mounted on a rotating drum carrying said first bearing portions, further characterized in that the first bearing portions for each shoe have a predetermined angular relation with the first bearing portions for the other shoes;

each shoe has a recess formed in said bottom side thereof with one of said first bearing portions being located on the wall of said recess that lies radially closest to the drum axis;

said drum is provided with an eccentric adjustment pin, constituting one of said second bearing portions, for each of said shoes; and

said adjustment pin being mounted with the eccentric portion thereof projecting upwardly into said recess of the respective shoe and engaging said first bearing portion of said recess;

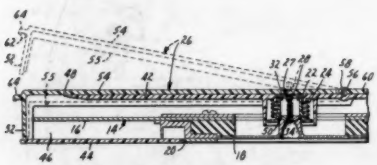
whereby the radial position of said shoe may be established during the assembly rather than during the production stage of drum manufacture.

4,184,184

CARTRIDGE WITH IMPROVED ACCESS DOOR CLOSING MEANS

Roland C. Hedin, Mahtomedi, and Lawrence R. Whitaker, Jr., St. Paul, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Sep. 1, 1978, Ser. No. 938,810
Int. Cl.[2] G11B *23/02*
U.S. Cl. 360—133 **3 Claims**



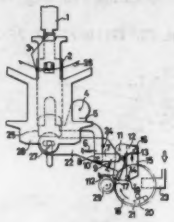
1. In a cartridge adapted to be received in a disk drive machine, said cartridge comprising a disk assembly including an outer portion coated with magnetizable material and a central hub portion, a housing around the disk assembly having generally parallel circular top and bottom walls, a cylindrical edge wall between the edges of said top and bottom wall, an opening in said edge and top walls affording access of a head in a said disk drive machine to read or write on the magnetizable coating of the disk assembly, an access door having first and second portions disposed generally at right angles to each other with the first portion and the adjacent part of the second portion adapted to close said opening when the door is in a closed position, and the second portion extending across the top surface of said housing past the axis of said disk assembly, means for mounting said door on said housing at the end of said second portion opposite said first portion for movement between a fully closed position over said opening and an open position with said door spaced from the opening, a plunger mounted in said top wall adjacent said hub portion for movement axially of said disk assembly, a compression spring located between and having opposite ends contacting said housing and said plunger respectively for biasing said plunger to a storage position against said hub portion to press said disk assembly against said bottom wall, means providing a linkage between said door and said plunger for moving said plunger to a retracted position spaced from said disk assembly when said door is opened, for moving said door to a semiclosed position upon movement of said plunger to its storage position and for affording movement of said door from its semiclosed to its fully closed position when said plunger is in its storage position, and means for moving said door from its semiclosed to its fully closed position when said plunger is in its storage position, the improvement wherein said door is a one-piece molding and said means for moving said door from its semiclosed to its fully closed position is a door spring with a lower spring constant than said compression spring tensioned between said plunger and said door.

4,184,185

CASSETTE TAPE EJECTING MECHANISM

Ken Yakame, Yamanashi, Japan, assignor to Kabushiki Kaisha Sankyo Seiki Seisakusho, Shimosuwa, Japan

Filed Aug. 14, 1978, Ser. No. 933,376
Claims priority, application Japan, Aug. 12, 1977, 52-97137
Int. Cl.[2] G11B *23/04, 15/10*
U.S. Cl. 360—137 **6 Claims**



1. A cassette tape ejecting mechanism for a cassette tape recording device having: a frame body; a pair of tape discs above which the cassette tape is set; a pair of capstan shafts; a pair of pinch rollers; a pair of pinch roller supporting arm levers; a pair of driving idlers frictionally engagable with the tape disca; idler supporting arm levers; a cassette tape ejecting button; and a cassette tape receiving member movable from the cassette tape play position to the cassette tape receiving/ejecting position, said cassette tape ejecting mechanism characterized by:

(a) driving gear wheel **29** rotated always in one direction, having gear teeth in its full circumferential surface and pivotally secured to the frame body;

(b) a first driven gear wheel **18** having at least one non-toothed portion and toothed portions and rotated together with said driving gear wheel when the toothed portion thereof is meshed with the driving gear wheel;

(c) biasing means **21** urging to engage said first driven gear wheel with the driving gear wheel;

(d) first gear wheel rotation preventing means **15** in abutment with an engaging pin **19** implanted in the driven gear wheel for preventing said first driven gear wheel from being rotated when the non-toothed portion thereof faces the driving gear wheel, said rotation preventing means being biased to one direction;

(e) first release means **12** for releasing the engagement between the preventing means and the engaging pin so that the first driven gear wheel is meshed with the driving gear wheel; and

(f) first transmitting means **23** for transmitting the rotational force of the driven gear wheel to the cassette tape receiving member when the driven gear wheel is rotated.

4,184,186

CURRENT LIMITING DEVICE FOR AN ELECTRIC POWER SYSTEM

Philip Barkan, Media, Pa., assignor to General Electric Company, Philadelphia, Pa.

Filed Sep. 6, 1977, Ser. No. 830,942
Int. Cl.[2] H02H *3/08*
U.S. Cl. 361—10 **41 Claims**

16. A current limiting device comprising:

(a) a normally-closed circuit interrupter adapted to be connected in series with a power circuit and having a source

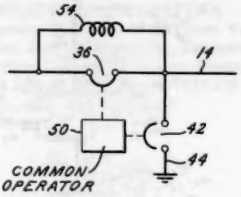
terminal and a load terminal at opposite electrical sides respectively of said circuit interrupter,

(b) a normally-open switch,

(c) means comprising said switch and effective when said switch is closed for electrically connecting said load terminal to ground via a low-impedance conductive path located electrically at the load terminal side of said circuit interrupter,

(d) switch-operating means responsive to a fault on said power circuit at the load terminal side of said circuit interrupter for rapidly closing said switch, thereby connecting said load terminal to ground through said switch,

(e) said switch-operating means operating at such high speed that effective closing of said switch occurs within ¼ cycle of power frequency current after inception of said fault, thereby effecting current-limiting action with respect to current passing in series through said interrupter and said load terminal into the portion of said power circuit at the load side of said conductive path to ground, said conductive path having a sufficiently low impedance upon closing of said switch to divert through said conductive path despite the presence of said fault sufficient current to effectively produce said current-limiting action,



(f) means mechanically interconnecting said interrupter and said switch-operating means for opening said interrupter in response to said fault sufficiently rapidly that said interrupter interrupts current through the interrupter at one of the first three natural current zeros following fault-inception,

(g) an impedance connected in parallel with said interrupter for conducting current, limited in magnitude by said impedance, around said interrupter when said interrupter has interrupted the current therethrough,

(h) and means for reopening said low-impedance conductive path immediately after said interrupter has interrupted and while said interrupter is still open for interrupting current then flowing through said low-impedance conductive path.

4,184,187

UNBALANCED DC VOLTAGE DETECTING CIRCUIT

Tadao Suzuki, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Jul. 19, 1978, Ser. No. 926,030
Claims priority, application Japan, Jul. 28, 1977, 52-90641
Int. Cl.² H02H *3/20*
U.S. Cl. 361—90 **14 Claims**

1. An unbalanced DC voltage detector comprising:

(a) signal input means having an output terminal at which an unbalanced DC voltage can occur,

(b) a low pass filter connected to said output terminal of said signal input means,

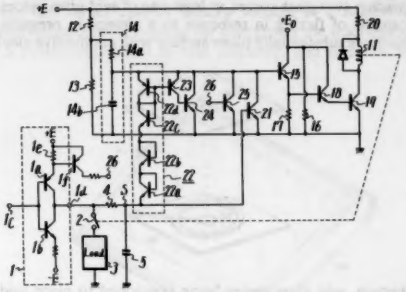
(c) first and second switching transistor means,

(d) means for connecting said first switching transistor means to said low pass filter;

(e) a DC level shifter,

(f) means for connecting said second switching transistor means to said low pass filter through said DC level shifter, and

(g) detecting means connected to said first and second switching transistor means so as to produce a control signal when the unbalanced DC voltage exceeds a predetermined value.

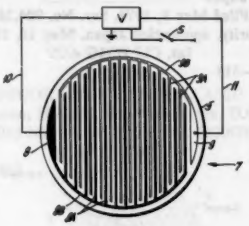


4,184,188

SUBSTRATE CLAMPING TECHNIQUE IN IC FABRICATION PROCESSES

Donald D. Briglia, Los Altos, Calif., assignor to Veeco Instruments Inc., Plainview, N.Y.

Filed Jan. 16, 1978, Ser. No. 869,523
Int. Cl.² H02N *13/00*
U.S. Cl. 361—234 **11 Claims**



1. A clamp for supporting a substrate for use in semiconductor fabrication systems comprising a thermally conductive electrically insulative support, multi-electrode capacitor means mounted on the support to establish an electric field and having at least two terminals for connection to a voltage source, and thermally conductive means oriented to electrically insulate said capacitor means from said substrate while providing thermal conductivity therebetween.

4,184,189

CAPACITIVE PRESSURE SENSOR AND METHOD OF MAKING IT

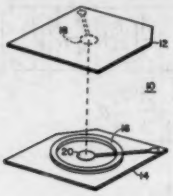
Earl K. Davis, Tempe; Kent W. Hansen, Scottsdale; Scot W. Taylor, Tempe, and Robert M. Wentworth, Phoenix, all of Ariz., assignors to Motorola, Inc., Schaumberg, Ill.

Filed Aug. 14, 1978, Ser. No. 933,318
Int. Cl.² C03B *23/20*
U.S. Cl. 361—283 **13 Claims**

1. A method for fabricating a pressure sensor comprising vacuum fining a sealing glass mixture; providing two substantially flat glass plates having conductive electrodes thereon, at least one of said glass plates being flexible to render it capable of deforming in response to a change in pressure; applying said sealing glass mixture to one of said glass plates in the shape of a perimeter seal; positioning said plates with a space between said electrodes; evacuating the space between said electrodes

to a reference pressure; heating said glass plates and said sealing glass mixture to a temperature to cause said mixture to flow and to seal together said plates.

6. A capacitive sensor for measuring ambient pressure comprising: two glass pieces, at least one of said glass pieces being capable of flexing in response to a change in pressure, each having a substantially plane surface with conductive electrodes

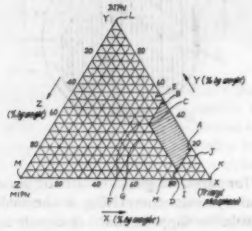


thereon, said glass pieces being positioned to place said conductive electrodes in a spaced apart, substantially parallel relationship; a sealing glass mixture disposed on one of said pieces to seal together said glass pieces, said mixture and said glass pieces acting together to bound a volume having a reference pressure therein whereby changes in ambient pressure cause a change in the capacitance measured between said conductive electrodes.

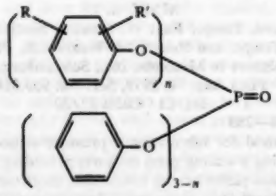
4,184,190
ELECTRICAL CAPACITOR

Sadayoshi Mukai; Yoshiaki Otani, and Osamu Yamaguchi, all of c/o Nissin Electric Co., Ltd., 47, Umezu Takase-cho,, Ukyo-ku, Kyoto, Japan

Filed May 9, 1978, Ser. No. 904,265
Claims priority, application Japan, May 16, 1977, 52/56768
Int. Cl.[2] H01G *4/22*
U.S. Cl. 361—315 8 Claims



1. An electrical capacitor comprising a casing, a capacitor element in said casing and an insulating oil enclosed in said casing to impregnate said element, said oil comprising a mixture of: 50% to 80% by weight triaryl phosphate having the structural formula of

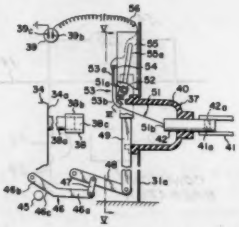


wherein N=1 to 3; R and R' are alkyl groups, the number of R groups attached to each benzene ring being 1 and the number of R' groups attached to each benzene ring being 0 or 1, and the total number of the carbon atoms contained in said alkyl groups attached to each benzene ring is 1 to 5; 5% to 50% by weight of a first insulating oil the principal component of which is diisopropyl naphthalene; and a second insulating oil in an amount greater than 0% by weight an up to 15% by weight, the principal component of said second insulating oil being monoispropyl naphthalene; the total of the amounts of said triaryl phosphate, said first insulating oil and said second insulating oil being 100% by weight.

4,184,191
ENCLOSED SWITCHBOARDS WITH INSULATION TEST CONTACT MEMBER

Isao Jinnai, Tama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kanagawa, Japan

Filed Oct. 20, 1978, Ser. No. 953,033
Claims priority, application Japan, Oct. 27, 1977, 52/128104
Int. Cl.[2] H02B *1/04*
U.S. Cl. 361—336 10 Claims



1. In an enclosed switchboard having:

a stationary contact connected to a load, and

a movable electrical equipment of the drawout type including a movable contact, said movable electrical equipment being movable between a connected position in which said movable contact is in engagement with said stationary contact and a disconnected position in which said movable contact is out of engagement with said stationary contact,

the improvement which comprises:

a test contact member movable between an engaged position in which said test contact member is in engagement with said stationary contact and an unengaged position in which said test contact member is out of engagement with said stationary contact, and

actuating means for actuating said test contact member such that said test contact member is in said engaged position when said electrical equipment is in said disconnected position, and in said unengaged position when said electrical equipment is in said connected position.

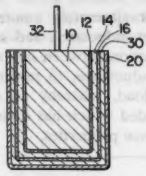
4,184,192
SOLID ELECTROLYTE COMPACITOR USING LOW RESISTIVITY METAL OXIDE AS CATHODE COLLECTOR

Akihiko Yoshida, and Atsushi Nishino, both of Kadoma, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Feb. 15, 1978, Ser. No. 877,839
Claims priority, application Japan, Feb. 15, 1977, 52-15655; Feb. 24, 1977, 52-20017; Mar. 18, 1977, 52-30931
Int. Cl.[2] H01G *9/00;* B01J *17/00*
U.S. Cl. 361—433 19 Claims

1. In a solid electrolyte capacitor having an anode body of a valve metal, a dielectric oxide film formed on the surface of the anode body by anodization, a solid electrolyte layer of a semiconductive metal oxide formed on the dielectric oxide film, and a cathode collector layer formed on the solid electrolyte

layer, the improvement comprising said cathode collector layer comprising as a substantial material at least one low



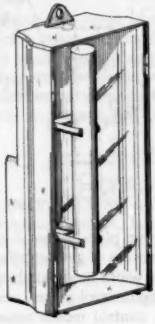
resistivity metal oxide selected from the group consisting of ruthenium oxide, rhodium oxide, palladium oxide, rhenium oxide, osmium oxide and iridium oxide.

4,184,193

MULTI-PURPOSE LANTERN

William R. Heffernan, Westfield; Mary-Louise Vega, Califon, both of N.J., and Joel A. Gingras, Sr., Doylestown, Pa., assignors to American Cyanamid Company, Stanford, Conn.

Filed Jun. 14, 1978, Ser. No. 915,428
Int. Cl.[2] F21K *2/00*
U.S. Cl. 362—34 **4 Claims**



1. A lantern comprising a chemiluminescent lightstick, a lantern frame, and a reflective sheet, said lantern frame comprising a rectangular box having long side walls and end walls and a rear wall, with one face of said box open to provide a rectangular window defined by the front edges of said side and end walls, the length of said frame being longer than said lightstick; said reflective sheet being fitted in said frame as a longitudinal concave reflective surface and retained said frame by retaining means attached to said frame; said lightstick being held inside said frame by clamping means attached to said frame at a lightstick position in front of said longitudinal concave reflective surface, the longitudinal axes of said frame, concave surface and frame being all parallel with each other.

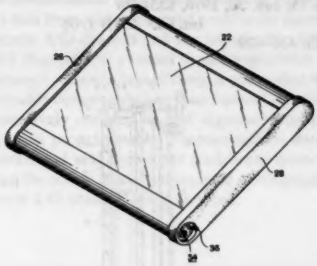
4,184,194

SELF-ENERGIZED PORTABLE HIGH DENSITY LIGHT DISPLAY UNIT

Koichi Shofu, 13910 Northwest Passage, #304, Marina Del Rey, Calif. 90291

Filed Jun. 23, 1978, Ser. No. 918,348
Int. Cl.[2] G09F *13/04*
U.S. Cl. 362—97 **2 Claims**

1. A light display unit comprising: a casing having an open top and forming battery housings along at least one side thereof; a circuit board position in said casing; a reflective panel positioned in said casing and extending across the open top; a translucent panel mounted over the reflective panel and extending across the open top of the casing; a plurality of fluorescent tubes mounted on said reflective panel under said translucent panel and connected to said circuit board, said circuit board including converter circuitry for converting a relatively low direct current battery voltage to a relatively high alternating current voltage for energizing the fluorescent tubes; a switch connected to said circuitry, and said circuit



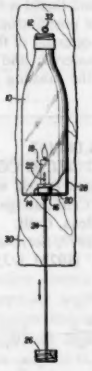
board including a relay for connecting some of said fluorescent tubes in series across the alternating current voltage when the switch is first turned on, and for subsequently connecting all of said fluorescent tubes in series across said alternating current voltage; and a pair of end members serving to hold the aforementioned components of the display unit together.

4,184,195

DECORATIVE CANDLE LAMP

Charles P. Duncan, 109 15th St., Washington, D.C. 20003

Filed Mar. 6, 1978, Ser. No. 883,678
Int. Cl.[2] F23D *3/16*
U.S. Cl. 362—163 **6 Claims**



1. A candle lamp comprising
an upright chimney made at least in part from heat resistant, light transmitting material, and having a bottom wall and a top opening;
an aperture in the bottom wall;
a candle holder supported within the chimney by the bottom wall;
a lifter connected to the candle holder and extending downwardly through the aperture in the bottom wall;
the lifter being arranged to permit the candle holder to be raised substantially to the top opening of the chimney.

4,184,196

DIAGNOSTIC LAMP, PARTICULARLY FOR CHECKING TEETH

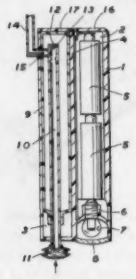
Michel A. Moret, 24, rue des Vollandes, 1225 Chene Bourg, and Philippe G. E. Woog, Villa "Le Sequoia" Chemin Botterel, 1222 Vesenaz, both of Switzerland

Filed Nov. 24, 1976, Ser. No. 744,751

Claims priority, application Switzerland, Nov. 28, 1975, 15444/75; Jun. 30, 1976, 8334/76

Int. Cl.² A61B *1/06*

U.S. Cl. 433—29 **14 Claims**



1. A pocket-size diagnostic lamp particularly for checking teeth by fluorescent excitation of a fluorescible material applied to the parts of the body to be tested, said lamp comprising a housing; a light source capable of exciting fluorescible material and battery means mounted by the housing for supplying electrical energy to the light source; a dispenser for the fluorescible material, the dispenser being provided with an immersion tube therein having one end which projects out of the housing, a resilient pushbutton closing the immersion tube outside the housing, the other end of the immersion tube located within the housing and having a valved opening, an outlet nozzle which branches from the immersion tube and projecting out of the housing, the nozzle being provided with a valve, whereby when the resilient pushbutton is pressed, the valved opening of the immersion tube closes and liquid is forced out through the outlet nozzle, and when the pushbutton is released, suction is created to open the valved opening of the immersion tube and suck in the fluorescible material; and mounting means for coupling the dispenser to the housing in an interchangeable manner.

4,184,197

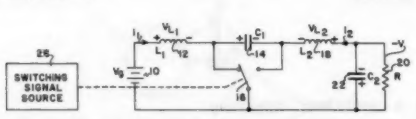
DC-TO-DC SWITCHING CONVERTER

Slobodan M. Cuk, Huntington Beach, and Robert D. Middlebrook, Pasadena, both of Calif., assignors to California Institute of Technology, Pasadena, Calif.

Filed Sep. 28, 1977, Ser. No. 837,532

Int. Cl.² H02M *3/335*

U.S. Cl. 363—16 **33 Claims**



1. A dc-to-dc converter having both input and output current nonpulsating for applying an input voltage from a source to a load, said converter being comprised of:

an input inductance,

storage capacitance,

an output inductance,

means connecting said input voltage source, said input inductance, said storage capacitance, said output inductance, and said load in series to form a series circuit, said series circuit having a junction between said input inductance and said storage capacitance, and a junction between said storage capacitance and said output inductance, and

switching means for alternately connecting the junction between said input inductance and said storage capacitance, and the junction between said storage capacitance and said output inductance, to return current paths for said source and load, whereby an improved dc-to-dc converter is provided which has optimum topology and superior performance properties.

4,184,198

THREE-PHASE VOLTAGE GENERATOR RESPONSIVE TO DC CONTROL PULSES

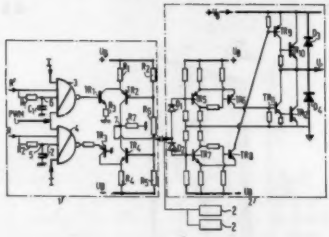
Paul I. Vermaes, Delft, and Paul J. Vink, Amsterdam, both of Netherlands, assignors to Ultra Centrifuge, The Hague, Netherlands

Filed Oct. 5, 1976, Ser. No. 729,679

Claims priority, application Netherlands, Oct. 9, 1975, 7511908

Int. Cl.² H02M *7/537*

U.S. Cl. 363—71 **5 Claims**



1. Apparatus for supplying plural-phase a.c. voltages to devices, such as hysteresis motors of gas centrifugal machines, comprising a source of pulse width modulated signals; a single control circuit for generating control pulses, said control circuit including a respective control means associated with a respective phase of said plural-phase a.c. voltages, said control means being responsive to said pulse width modulated signals for generating control pulses for the phase with which said respective control means is associated; and plural voltage generating means coupled to said control means for receiving said control pulses therefrom, each of said voltage generating means including a pulse generator stage responsive to said control pulses and an output stage connected to said pulse generator stage for switching an output voltage between d.c. voltage levels, whereby a plural-phase a.c. voltage is derived from the output stages of respective voltage generating means coupled to corresponding ones of said control circuits.

4,184,199

HEAVY DUTY RECTIFIER

Nils Bardahl, Uttenreuth, and Günter Kliesch, Bubenreuth, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Aug. 14, 1978, Ser. No. 933,531

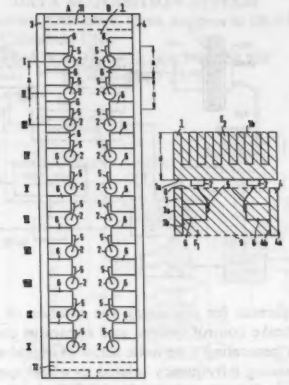
Claims priority, application Fed. Rep. of Germany, Aug. 31, 1977, 2739242

Int. Cl.² H02M *7/06*

U.S. Cl. 363—141 **5 Claims**

1. A heavy duty rectifier comprising an elongated rectifier member cooled by forced circulation on one broadside thereof, the exterior surfaces of said rectifier member defining a first shape having a first area, two rows of rectifier valves secured to said rectifier member in an electrically conducting manner

on said broadside, said rows being mutually equally spaced apart and said rectifier valves being mutually equally spaced, two elongated connecting members having mutually equally spaced terminals secured thereto in an electrically conducting manner on mutually facing surfaces thereof, each connecting member being associated with a respective row of said rectifier valves and a respective rectifier valve being electrically connected to a respective terminal, said connecting members being spaced from each other and from said rectifier member and being disposed at an angle to said broadside of said rectifier member so that exterior surfaces of said spaced connecting members define a second shape having a second area which are substantially the same as said first shape and said first area, respectively.

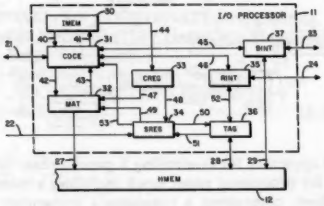


4,184,200

INTEGRATING I/O ELEMENT

Richard J. Wagner, West St. Paul, and Robert A. Melberg, Bloomington, both of Minn., assignors to Sperry Rand Corporation, New York, N.Y.

Filed Apr. 26, 1978, Ser. No. 899,908
Int. Cl.[2] G06F *1/00*
U.S. Cl. 364—200 **6 Claims**



1. A computer for processing multiple levels of secure data having a plurality of I/O channels comprising:

a segmented read/write memory having a separate segment corresponding to each discrete level of secure data to be processed wherein said separate segment contains a subsegment corresponding to each discrete I/O channel permitted to access data of the discrete level of secure data corresponding to said separate segment;

a data processor having access to said segmented read/write memory;

a segmented instruction memory unalterable by said computer containing a series of I/O instructions having a separate segment corresponding to each I/O channel;

a programmable communications data control element coupled to said segmented instruction memory and said segmented read/write memory having an interface to said data processor only for the exchange of command and status signals; wherein said programmable communications data control element is programmable through the execution of said series of I/O instructions;

means responsively coupled to said segmented read/write memory, said plurality of I/O channels, and said programmable communications data control element for transferring I/O data from said segmented read/write memory to each discrete I/O channel and for transferring I/O data from each discrete I/O channel to said segmented read/-write memory, wherein transferring is controlled by said programmable communications data control element; and

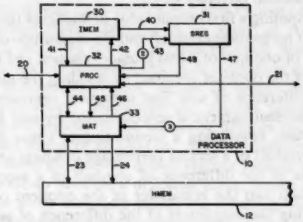
means responsively coupled to said segmented instruction memory, said programmable communications data control element, and said segmented read/write memory for restricting the access to said subsegment corresponding to the discrete I/O channel being serviced.

4,184,201

INTEGRATING PROCESSOR ELEMENT

Robert A. Melberg, Bloomington, and Richard J. Wagner, West St. Paul, both of Minn., assignors to Sperry Rand Corporation, New York, N.Y.

Filed Apr. 26, 1978, Ser. No. 899,909
Int. Cl.[2] G06F *1/00*
U.S. Cl. 364—200 **5 Claims**



1. A computer comprising:

a segmented read/write memory having a separate segment corresponding to each discrete level of secure data to be processed;

an I/O processor having access to said segmented read/-write memory;

a segmented instruction memory unalterable by said computer having a separate segment corresponding to each discrete level of secure data to be processed;

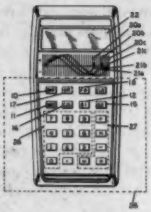
a programmable processor element having an interface to said I/O processor only for the exchange of command and status signals; and

means responsively coupled to said segmented instruction memory, said segmented read/write memory and said programmable processor element for restricting the access of said programmable processor element to writing in only said separate segment of said segmented read/write memory corresponding to said discrete level of secure data being processed and to reading from only said separate segments of said segmented read/write memory corresponding to said discrete level of secure data being processed or lower levels.

4,184,202
BIORHYTHM COMPUTER

Ian S. McCrae, Atlanta, Ga., assignor to Kosmos International Ltd., Nassau, The Bahamas

Filed Feb. 22, 1978, Ser. No. 880,046
Claims priority, application Japan, May 21, 1977, 52-59273
Int. Cl.[2] G06F *15/02, 15/42*
U.S. Cl. 364—413 4 Claims

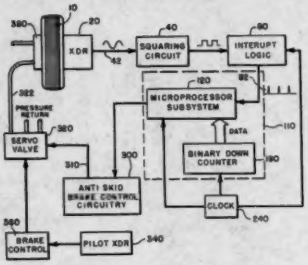


1. A calculator having a keyboard, a numerical display;
a first birthday key associated with said keyboard;
a biorhythm key associated with said keyboard;
a second birthday key associated with said keyboard;
a compatibility key associated with said keyboard;
a dedicated program for computing and storing in a first register a first numerical representation of a first date in response to selective operation of said first birthday key,
for computing three biothythm values of a person having a birthdate corresponding to said first date and storing a numerical value for said biorhythm values in a plurality of storage registers in response to selective operation of said biorhythm key;
for computing and storing in a second register a second numerical representation of a second date in response to said second birthday key,
for computing a first output value definable as the product of a first percentage constant and the magnitude of the difference of one-half of a first integer constant and the remainder of the quotient obtained by dividing the magnitude of the difference of said first numerical representation and said second numerical representation by said first integer constant, computing a second output value definable as the product of a second percentage constant and the magnitude of the difference of one-half of a second integer constant and the remainder of the quotient obtained by dividing the magnitude of the difference of said first numerical representation and said second numerical representation by said second integer constant, computing a third output value definable as the product of a third percentage constant and the magnitude of the difference of one-half of a third integer constant and the remainder of the quotient obtained by dividing the mangitude of the difference of said first numerical representation and said second numerical representation by said third integer constant, in response to selective operation of said compatibility key;
display generating means operatively interconnected with said dedicated program and said keyboard for simultaneously displaying said first output value, said second output value, and said third output value in said numerical display in response to said operation of said compatibility key,
each of said output values being separated from adjacent output values by a first separation indicium;
said display generating means being alternately operative for simultaneously displaying said three biorhythm values, each of said biorhythm values being separated from adjacent biorhythm values by a second separation indicium in response to said operation of said biorhythm key.

4,184,203
WHEEL SPEED SENSING SYSTEM

Thomas Skarvada, Woodland Hills, Calif., assignor to Crane Co., Chicago, Ill.

Filed Oct. 20, 1978, Ser. No. 953,126
Int. Cl.[2] G06F *15/20;* B60T *8/00*
U.S. Cl. 364—426 11 Claims

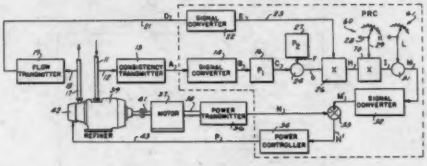


1. An apparatus for measuring the rotation of a rotatable wheel in a brake control system, said apparatus comprising:
means for generating a periodic series of digital signals, said series having a frequency related to wheel speed;
clock means for generating a series of clock signals;
means responsive to the clock means and to the series of digital signals for counting the number of clock signals generated during each of a sequence of measurement intervals, each of said measurement intervals corresponding in duration to the time interval separating a pair of digital signals, said sequence of measurement intervals being substantially contiguous in time.

4,184,204
PROGRAMMABLE REFINER CONTROLLER

Gary R. Flohr, Pittsfield, Mass., assignor to Beloit Corporation, Beloit, Wis.

Filed Oct. 6, 1978, Ser. No. 949,087
Int. Cl.[2] G06F *15/46;* B02C *7/14;* D21F *1/04*
U.S. Cl. 364—471 6 Claims



1. An apparatus for controlling a paper refiner with a load control for processing paper stock including a motor driving said refiner, comprising a consistency transmitter having a predetermined output signal range for measuring the consistency of the paper stock at the refiner and producing an analog signal, a flow transmitter for measuring flow of paper stock through said refiner, a first signal converter receiving the output of said consistency transmitter and converting it into a signal indicative of the percentage of full scale of said consistency transmitter, a first multiplier receiving the output of said first signal converter and multiplying it by a first constant P_1 that is determined by the signal range for the particular consistency transmitter, an adder receiving the output of said first multiplier and adding to it a signal proportional to a second constant determined by the signal range for the particular consistency transmitter, a second signal converter connected to said flow transmitter and converting it into a signal indicative of percentage of full range of said flow transmitter, and a

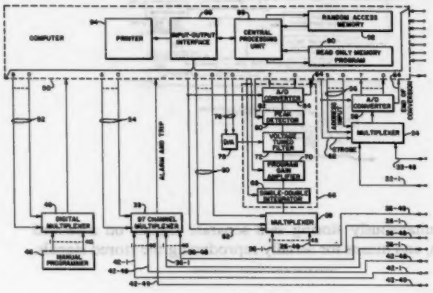
second multiplier receiving the outputs of said second converter and said adder and multiplying them together to obtain a signal indicative of tons of material per day flowing through said refiner.

4,184,205

DATA ACQUISITION SYSTEM

Robert S. Morrow, Columbus, Ohio, assignor to IRD Mechanalysis, Inc., Columbus, Ohio

Filed Nov. 25, 1977, Ser. No. 854,939
Int. Cl.[2] G06F *15/34*
U.S. Cl. 364—508 **20 Claims**



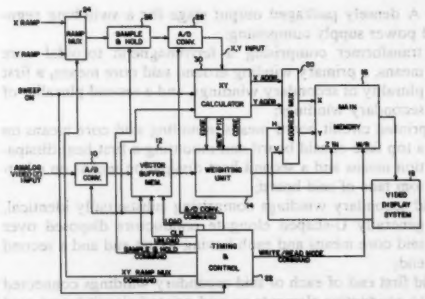
1. In a data acquisition system, the combination of a plurality of monitoring devices each adapted to produce an electrical signal indicative of a physical condition of apparatus to be monitored, computer apparatus including memory means and print-out means, multiplexing means for feeding each of said signals from the respective monitoring devices to said computer apparatus, means for periodically storing at least selected ones of said electrical signals from each monitoring device in said memory means, means in said computer apparatus for computing from the trend of a characteristic of the stored electrical signals from each monitoring device the probable time to failure of the monitored apparatus from which those signals were derived, and means responsive to said determining means for causing said print-out means to print indicia indicative of the probable time to failure.

4,184,206

SUBPIXEL X-Y COORDINATE ENCODING

Allen A. Harano, Oceanside, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Mar. 7, 1978, Ser. No. 884,328
Int. Cl.[2] G06F *15/20*; H04N *7/18*
U.S. Cl. 364—515 **10 Claims**



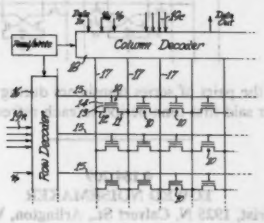
1. A method of encoding digitized video input signals from a display vector to an arrayed display memory in a manner to maximize the probability of entering the best picture element value into a particular X, Y location for picture elements along the vector comprising the steps of dividing each picture element into subelements, tracking said vector through each picture element to determine which groups of subelements are traversed, and weighting the value of a picture element as a function of the zones traversed by said vector.

4,184,207

HIGH DENSITY FLOATING GATE ELECTRICALLY PROGRAMMABLE ROM

David J. McElroy, Houston, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 762,613, Jan. 27, 1978. This application Jul. 12, 1978, Ser. No. 923,876
Int. Cl.[2] G11C *11/40*
U.S. Cl. 365—185 **10 Claims**



1. An electrically programmable, nonvolatile, floating gate, semiconductor memory array comprising: a plurality of MOS transistor devices each having a source, a drain, a floating gate, and a control gate, the floating gate being isolated from the channel between source and drain by thin oxide and the control gate being isolated from the floating gate by thin oxide, the transistor devices being arranged in an array of rows and columns, with the rows being separated by thick field oxide; means connecting the control gates of all devices in each row together to provide row lines; means including elongated parallel heavily-doped semiconductor regions forming the source and drain regions of the transistor devices connecting the sources and drains of all adjacent devices together to provide column lines; the heavily-doped regions formed with the thick field oxide to provide a diffusion mask; means for programming the array including means for selecting one of the row lines and applying a high voltage to it while applying a low voltage or reference potential to the remaining row lines, and means for selecting one pair of adjacent column lines and applying current through this pair while applying no current through all of the other pairs of column lines.

4,184,208

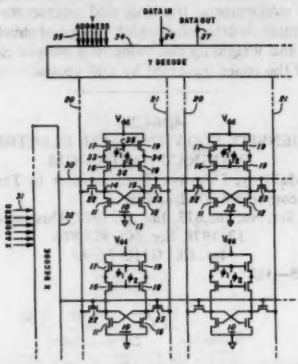
PSEUDO-STATIC SEMICONDUCTOR MEMORY CELL

Graham S. Tubbs, Houston, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Jul. 19, 1978, Ser. No. 925,916
Int. Cl.[2] G11C *11/40*
U.S. Cl. 365—203 **10 Claims**

1. A memory cell comprising a pair of driver transistors, first and second pairs of series transistors, and a pair of coupling transistors, each of the transistors having a current path and a control electrode, a pair of storage nodes, a pair of complementary data lines, each of coupling transistors having its current path connected in series between one of the data lines and one of the storage nodes, the current paths of the series transistors connecting the storage nodes to a voltage source via a pair of intermediate nodes, means for precharging the intermediate nodes during a first time period by applying operating voltage to the control electrodes of a first of the transistors in each of

the pairs of series transistors, and means for applying operating voltage to the control electrodes of the other of the transistors



in each of the pairs of series transistors during a second time period after said first time period in each refresh cycle.

4,184,209

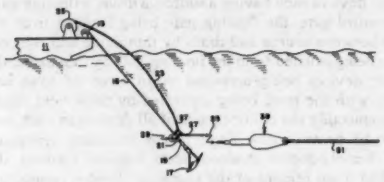
TOWED NOISEMAKER

Ralph P. Crist, 1925 N. Calvert St., Arlington, Va. 22301

Filed Oct. 10, 1952, Ser. No. 314,233

Int. Cl.[2] H04B *13/02*

U.S. Cl. 367—1 **5 Claims**



1. A towed decoy system adapted to be towed from a towing vessel, an electrically powered noisemaker, an electrical tow cable attached to said noisemaker, a depressor vane, a depressor cable connected to said depressor vane and to the towing vessel, and means interconnecting said depressor cable and said electrical tow cable at a point hear said depressor vane, said interconnecting means comprising a pair of cable grips respectively attached at one end to adjacent sections of said electrical tow cable and at their other ends to a snatch block movably mounted on said depressor cable thereby providing slack in said electrical tow cable, whereby said noisemaker is towed at a depth not less than that of the point of attachment of said snatch block to said depressor cable.

4,184,210

SONIC ECHO SCANNING AND FACSIMILE RECORDING OF WATER SUBMERGED SURFACES

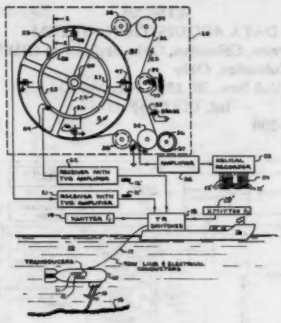
Julius Hagemann, 412 S. MacArthur Ave., Panama City, Fla. 32401

Filed Sep. 4, 1958, Ser. No. 759,105

Int. Cl.[2] G01S *9/66, 7/60*

U.S. Cl. 367—88 **4 Claims**

1. In a sonic echo system for classifying objects proud on the ocean floor in which a submarine vehicle moves through the ocean at a constant height above the ocean floor, scanning means for simultaneously deriving separate electric signals corresponding to the sonic reflecting values of parallel strips of the ocean floor extending athwartships of said vehicle, means



for simultaneously storing said separate signals on a record medium, and means for serially reproducing the stored signals.

4,184,211

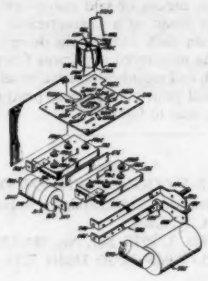
OUTPUT STAGE FOR SWITCHING REGULATED POWER SUPPLY

Wallace N. Hersom, Tustin, and John E. Crum, Mission Viejo, both of Calif., assignors to LH Research, Irvine, Calif.

Filed May 23, 1978, Ser. No. 908,563

Int. Cl.[2] H02M *7/06*

U.S. Cl. 363—141 **27 Claims**



1. A densely packaged output stage for a switching regulated power supply comprising:

a transformer comprising a ferromagnetic toroidal core means, a primary winding around said core means, a first plurality of secondary windings, and a second plurality of secondary windings;

a printed circuit board means mounting said core means on a top face of said board and mounting a first heat dissipation means and a second heat dissipation means on a bottom face of said board;

said secondary windings comprising substantially identical, generally U-shaped elongate conductors disposed over said core means and each having a first end and a second end;

said first end of each of said secondary windings connected to conductive elements on said printed circuit board, said conductive elements located in a plane of said printed circuit board generally interior of and surrounded by said toroidal core means;

said second end of each of said secondary windings connected to conductive elements on said printed circuit board, said conductive elements located in a plane of said printed circuit board generally outside of and surrounding said toroidal core means;

a plurality of first diode rectifying means, each of said first means having its cathode connected to said first heat dissipation means for both heat conduction thereto and electrical connection therewith and its anode connected by conductive elements on said printed circuit board to the second end of one of said first plurality of secondary windings;

a plurality of second diode rectifying means, each of said second means having its anode connected to said second heat dissipation means for both heat conduction thereto and electrical connection therewith and its cathode connected by conductive elements on said printed circuit board to the second end of one of said second plurality of secondary windings;

conductive means on said printed circuit board connecting said first end of each of said first plurality of secondary windings to said second heat sink; and

conductive means on said printed circuit board connecting said first end of each of said second plurality of secondary windings to said first heat sink.

DESIGNS

JANUARY 15, 1980

253,916
CRASH HELMET
Alberto Vitaloni, Turin, Italy, assignor to Squirrel S.p.A., Cambiano, Italy
Filed Feb. 22, 1978, Ser. No. 879,983
Term of patent 14 years
Int. Cl. D2—*03*
U.S. Cl. D2—232

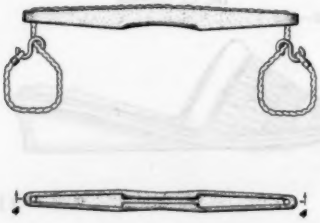
253,917
FOOT ORNAMENT
Bette J. Wilkinson, 9330 Huntcliff Trace, Atlanta, Ga. 30338
Filed Aug. 29, 1977, Ser. No. 828,876
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—270

253,918
SKI BOOT
Corky Fowler, 4340 Cezanne Ave., Woodland Hills, Calif. 91364
Filed Apr. 3, 1978, Ser. No. 892,476
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—276

253,919
SLIPPER
Henry D. Sweeny, 142 Stoneybrook Dr., Kitchener, Ontario, N2M 4L7, Canada
Filed Nov. 25, 1977, Ser. No. 855,600
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—283

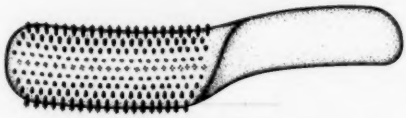
253,920
MOLDED GLOVE
Paul W. Heavner, Jr., Kettering, and William E. LeMay, Waynesville, both of Ohio, assignors to Baxter Travenol Laboratories, Inc.
Continuation-in-part of Ser. No. 724,661, Sep. 15, 1976. This application Nov. 25, 1977, Ser. No. 854,551
Term of patent 14 years
Int. Cl. D2—*06*
U.S. Cl. D2—374

253,921
SKI CARRYING HANDLE
Bela G. Szabo, Carnegie, and Domenic J. Borgese, Pittsburgh, both of Pa., assignors to B. B. & L. Industries, Inc., Pittsburgh, Pa.
Filed Jun. 29, 1978, Ser. No. 920,334
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D3—36



253,922
HANDBAG
Charlotte Barbaresi, Greenwich, Conn., assignor to Acricite Company, Inc., Bridgeport, Conn.
Filed Nov. 30, 1977, Ser. No. 856,194
Term of patent 14 years
Int. Cl. D3—*01*
U.S. Cl. D3—53

253,923
HAIR BRUSH
Toshiichi Usui, Tokyo, Japan, assignor to Kao Soap Co., Ltd., Japan
Filed Apr. 13, 1978, Ser. No. 896,052
Claims priority, application Japan, Oct. 20, 1977, 52-41834
Term of patent 14 years
Int. Cl. D4—*02*
U.S. Cl. D4—35



253,924
DINING CHAIR
Huey T. Keller, High Point, N.C., assignor to Vaughan Furniture Company, Inc., Galax, Va.
Filed Aug. 8, 1977, Ser. No. 822,605
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—70

253,925

TABLE

Huey T. Keller, High Point, N.C., assignor to Vaughan Furniture Company, Inc., Galax, Va.

Filed Dec. 16, 1977, Ser. No. 822,616
Term of patent 14 years
Int. Cl. D6—*03*
U.S. Cl. D6—146

253,926

COMBINED NAIL STORAGE AND DISPLAY RACK

John H. Jervis, West Milford, N.J., assignor to Borneo Sumatra Trading Company, Rutherford, N.J.

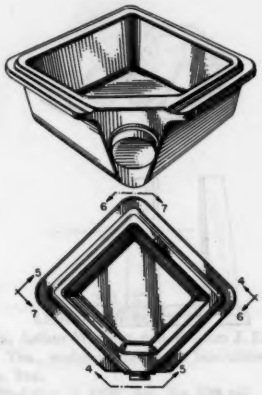
Filed Dec. 5, 1977, Ser. No. 857,861
Term of patent 14 years
Int. Cl. D6—*04*; D20—*02*
U.S. Cl. D6—186

253,927

COMBINED FREEZABLE WATER BOTTLE AND TRAY

James R. Conley, Wichita, Kans., assignor to The Coleman Company, Inc.

Filed Oct. 17, 1977, Ser. No. 842,930
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D7—37

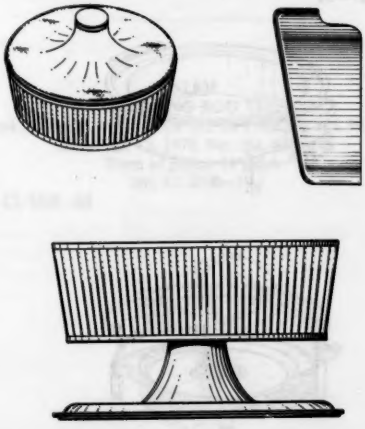


253,928

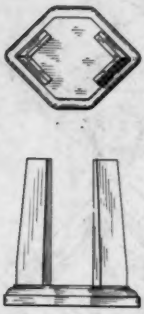
COMBINED CANISTER AND FLOWER ARRANGEMENT CONTAINER

Richard W. Murphy, 17846 San Clemente St., Fountain Valley, Calif. 92629

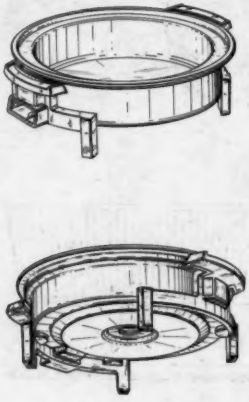
Filed Jul. 6, 1977, Ser. No. 813,410
Term of patent 14 years
Int. Cl. D7—*07*
U.S. Cl. D7—79



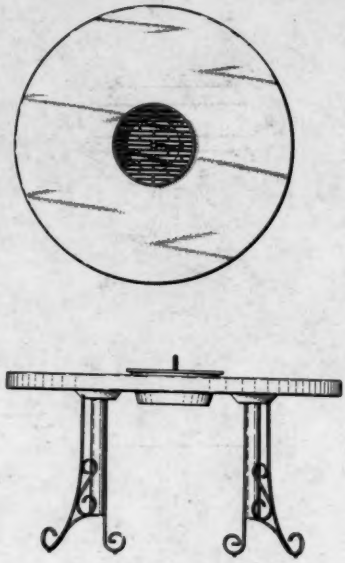
253,929
HOLDER FOR BUTTER PATTIES
Charles N. Epperson, 5960 S. Lewis, Tulsa, Okla. 74105
Filed Nov. 14, 1977, Ser. No. 851,522
Term of patent 14 years
Int. Cl. D7—*06*
U.S. Cl. D7—84



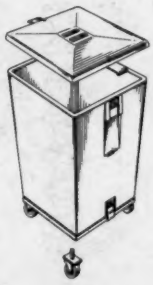
253,930
SKILLET
R. C. Zinkgraf, West Bend, Wis., and David L. Painter, Glenview, Ill., assignors to Dart Industries Inc., Los Angeles, Calif.
Filed Nov. 10, 1977, Ser. No. 850,182
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D7—94



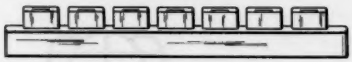
253,931
TABLE WITH CENTRAL GRILL
LaQuae C. DeVischer, 2714 E. Maplewood Ave., Littleton, Colo. 80120, and William B. Smyth, 9106 W. Maplewood Ave., Littleton, Colo. 80123
Filed Feb. 27, 1978, Ser. No. 881,889
Term of patent 14 years
Int. Cl. D7—*02*; D6—*03*
U.S. Cl. D7—107



253,932
COMBINED COVERED RECEPTACLE AND REMOVABLE DOLLY THEREFOR
H. Ray Mockler, 2321 N. Rainbow Vista Dr., Tucson, Ariz. 85712
Filed Sep. 22, 1977, Ser. No. 835,678
Term of patent 14 years
Int. Cl. D7—*07*; D12—*99*
U.S. Cl. D7—194

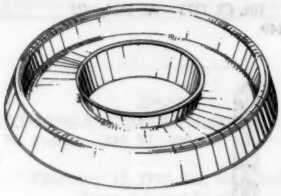


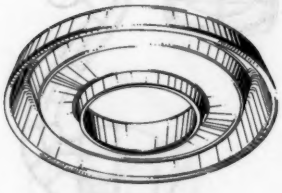
253,933
CONTAINER FOR PILLS OR THE LIKE
Roy G. Bridges, 641 S. Fourth Ave., La Puente, Calif. 91746
Filed Apr. 19, 1977, Ser. No. 788,897
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—18



253,934
GEM CONTAINER
Ernest J. Talis, 9 Woodlawn St., Jamaica Plain, Mass. 02130
Filed Mar. 9, 1977, Ser. No. 775,853
Term of patent 3½ years
Int. Cl. D9—*01*
U.S. Cl. D9—121

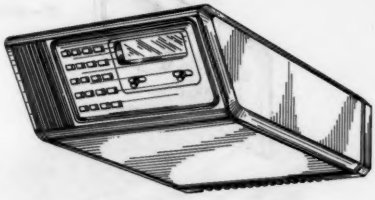
253,935
COVER FOR A CONTAINER
Robert H. C. M. Daenen, Hekelgem, Belgium, assignor to Dart Industries Inc., Los Angeles, Calif.
Filed Nov. 7, 1977, Ser. No. 849,067
Term of patent 14 years
Int. Cl. D9—*07*
U.S. Cl. D9—254





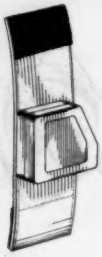
253,936
SUNDIAL WATCH
Anthony F. Bova, 8502 Wendell Ave., and Caesar Bova, 8659 Hoerner Ave., both of Baltimore, Md. 21234
Filed Oct. 21, 1977, Ser. No. 844,505
Term of patent 14 years
Int. Cl. D10—*03*
U.S. Cl. D10—45

253,937
LORAN C RECEIVER
Eugene J. Sulek; Arthur W. Chin, and William J. Lawrence, all of Lubbock, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.
Filed Oct. 3, 1977, Ser. No. 839,143
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—46

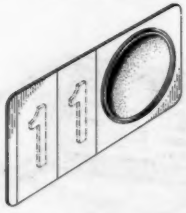


253,938
DOWSING ROD TIP
Samuel E. Wolfe, 13451 Ector St., La Puente, Calif. 91746
Filed Feb. 13, 1978, Ser. No. 877,411
Term of patent 14 years
Int. Cl. D10—*99*
U.S. Cl. D10—46

253,939
WRIST BAND MOUNTED TAPE MEASURE
Robert C. Montgomery, 8837 N. 17th Dr., Phoenix, Ariz. 85021
Filed Feb. 22, 1978, Ser. No. 879,866
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—72



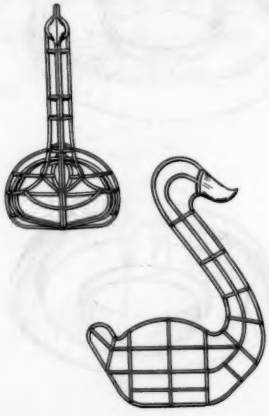
253,940
ELEVATOR FLOOR REGISTRATION BUTTON
Denis E. Bedel, Pittsburgh, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.
Filed Apr. 27, 1977, Ser. No. 791,369
Term of patent 14 years
Int. Cl. D10—*06*
U.S. Cl. D10—108



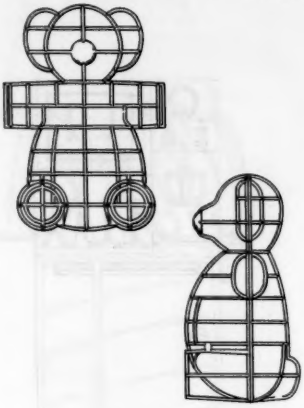
253,941
RING
Bill Corbin, Austin, Tex., assignor to Artcarved Class Rings, Inc., New York, N.Y.
Filed Dec. 20, 1977, Ser. No. 862,349
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—33

253,942
MULTIPLE DIAMOND RING
Josef J. Barr, 293 S. Country Rd., Palm Beach, Fla. 33480
Filed Jan. 26, 1978, Ser. No. 872,742
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—34

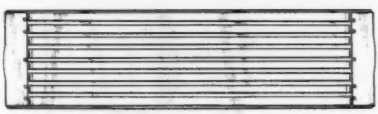
253,943
THREE DIMENSIONAL TOPIARY FIGURE
William T. Bales, Whitehouse, Ohio, assignor to Plantables, Inc., Toledo, Ohio
Filed Oct. 16, 1978, Ser. No. 951,999
Term of patent 14 years
Int. Cl. D11—*02*; D21—*02*
U.S. Cl. D11—149



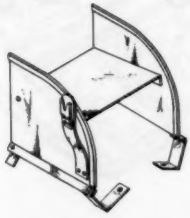
253,944
THREE DIMENSIONAL TOPIARY FIGURE
William T. Bales, Whitehouse, Ohio, assignor to Plantables, Inc., Toledo, Ohio
Filed Oct. 16, 1978, Ser. No. 952,006
Term of patent 14 years
Int. Cl. D11—*02*; D21—*02*
U.S. Cl. D11—149



253,945
FREIGHT RETAINING PANEL FOR A RAILROAD CAR
Michael R. Youness, 615 Canyon, Rochester, Mich. 48063
Filed Sep. 29, 1977, Ser. No. 838,126
Term of patent 14 years
Int. Cl. D12—*03*
U.S. Cl. D12—42

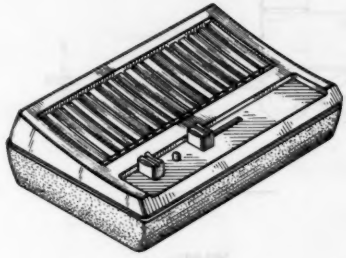


253,946
AUTOMOBILE CONSOLE MOUNTING STAND
Edward W. Fought, 1339 W. 10th St., Port Angeles, Wash. 98362
Filed Aug. 15, 1977, Ser. No. 824,297
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—155

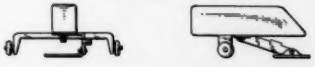


253,947
DESK-TOP ELECTRONIC COMPUTER
Mario Bellini, Milan, Italy, assignor to Ing. C. Olivetti & C., S.p.A.
Filed Oct. 18, 1977, Ser. No. 843,356
Claims priority, application Italy, May 4, 1977, 53125/77[U]
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D14—45

253,948
RADIO
John W. Edwards, Lake Zurich, Ill., assignor to Modular Radio Corporation
Filed Sep. 2, 1977, Ser. No. 830,493
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—71

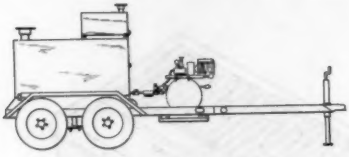


253,949
CLOSED CIRCUIT TELEVISION CAMERA FOR USE IN DISPLAYING GRAPHIC MATERIAL OR THE LIKE
Takashi Mikami, 11-36 Morino 4-Chome, Machida-shi, Tokyo, Japan
Filed Jul. 27, 1977, Ser. No. 819,585
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—78



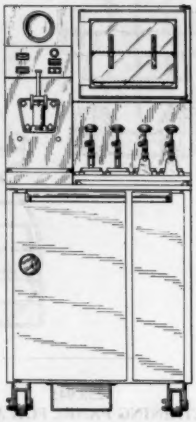
253,950
COMBINED AUGER AND TINE UNIT FOR A GARDEN TILLER
Gary L. Sheldon, Phillipsburg, Mo., assignor to Garden Maid, Inc., Lebanon, Mo.
Filed Jan. 30, 1978, Ser. No. 873,122
Term of patent 14 years
Int. Cl. D15—*03*
U.S. Cl. D15—12

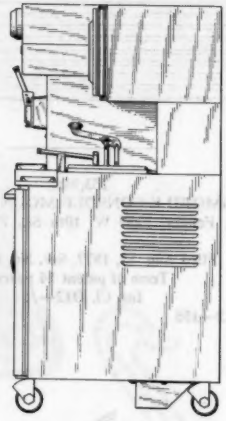
253,951
PORTABLE CLEANING SYSTEM
Bobby L. Waters, Rte. 8, Maryville, Tenn. 37801
Filed Sep. 26, 1977, Ser. No. 836,484
Term of patent 14 years
Int. Cl. D15—*05*
U.S. Cl. D15—34



253,952
YARN TENSION DEVICE
Edward J. McBride, P.O. Box 311, Moorestown, N.J. 08057
Filed Jun. 3, 1977, Ser. No. 804,179
Term of patent 14 years
Int. Cl. D15—*06*
U.S. Cl. D15—78

253,953
SUNDAE MACHINE
Richard R. Salsbury, Schaumburg; Thaddeus J. Kalowski, La Grange, and Richard M. Keyes, Rockford, all of Ill., assignors to Restaurant Technology, Inc.
Filed Jun. 2, 1977, Ser. No. 802,716
Term of patent 14 years
Int. Cl. D15—*08*
U.S. Cl. D15—111





253,954
PAIR OF SPECTACLES
David W. Johnsen, Woodstock, Conn., assignor to American Optical Corporation, Southbridge, Mass.
Filed Apr. 27, 1978, Ser. No. 900,451
Term of patent 14 years
Int. Cl. D16—*06*
U.S. Cl. D16—65

253,955
CASE FOR A PRINTING CALCULATOR
Eugene J. Sulek, and Richard R. Nesbitt, both of Lubbock, TX, assignors to Texas Instruments Incorporated, Dallas, Tex.
Filed Feb. 21, 1978, Ser. No. 879,553
Term of patent 14 years
Int. Cl.[2] D18—*01*
U.S. Cl. D18—7

253,956
PERSPECTIVE DRAWING INSTRUMENT
George E. Edlund, 707 Shary Ave., Mountain View, Calif. 94041
Filed May 2, 1977, Ser. No. 793,192
Term of patent 14 years
Int. Cl. D19—*06*
U.S. Cl. D19—35

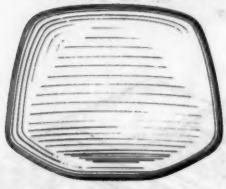
253,957
GOLF CLUB HEAD
Douglas L. Yates, 52 Kingsbury Rd., New Rochelle, N.Y. 10804
Filed Dec. 3, 1976, Ser. No. 747,300
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—215

253,958
COMBINED ALARM FISHING ROD AND HOLDER
Woodrow Bullock, 321½ Division St., Camden, N.J. 08103
Filed Oct. 13, 1977, Ser. No. 841,965
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—13

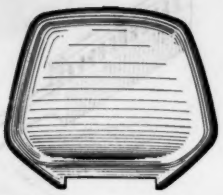
253,959
COVER FOR A WATER CLOSET TANK
Cyril J. Brookes, Box 283, Campbelltown, N.S.W. 2560, Australia
Filed Oct. 8, 1976, Ser. No. 730,787
Claims priority, application Australia, May 7, 1976, 69533
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D23—69

253,960
COVER FOR A WATER CLOSET TANK
Cyril J. Brookes, Box 283, Campbelltown, N.S.W. 2560, Australia
Filed Oct. 8, 1976, Ser. No. 730,788
Claims priority, application Australia, May 7, 1976, 69532
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D23—69

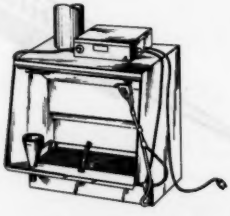
253,961
COVER FOR A WATER CLOSET TANK
Cyril J. Brookes, Box 283, Campbelltown, N.S.W., 2560, Australia
Filed Oct. 8, 1976, Ser. No. 730,789
Claims priority, application Australia, May 7, 1976, 69530
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D23—69



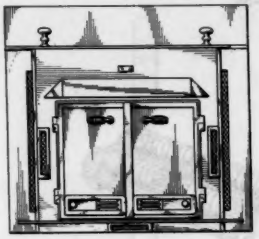
253,962
COVER FOR A WATER CLOSET TANK
Cyril J. Brookes, Box 283, Campbelltown, N.S.W., (2560) Australia
Filed Oct. 8, 1976, Ser. No. 730,790
Claims priority, application Australia, May 7, 1976, 69531
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D23—69



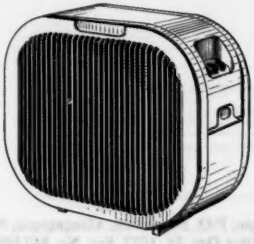
253,963
HOOD FOR WASHING OBJECTS WITH VOLATILE LIQUIDS
Kent E. G. Berglund, Södra Snäckskärsvagen 4, S-417 29 Göteborg, Sweden
Filed Oct. 18, 1977, Ser. No. 843,440
Claims priority, application Sweden, Apr. 19, 1977, 770877
Term of patent 14 years
Int. Cl. D23—*04*
U.S. Cl. D23—151



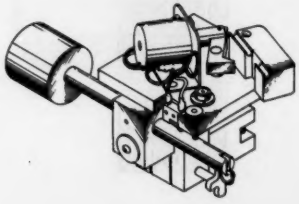
253,964
COMBINED FIREPLACE ENCLOSURE AND STOVE
Carrol E. Buckner, Rte. 2, Weaverville, N.C. 28787
Filed Oct. 26, 1977, Ser. No. 845,709
Term of patent 14 years
Int. Cl. D23—*03*; D7—*08*
U.S. Cl. D23—94



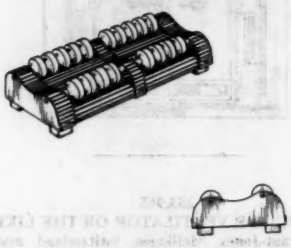
253,965
CASING FOR VENTILATOR OR THE LIKE
Klaus Ehrentraut-Jones, Mellingen, Switzerland, assignor to Ventronic Technic AG., Zug, Switzerland
Filed Nov. 24, 1976, Ser. No. 744,834
Claims priority, application Hague, Sep. 23, 1976, 63766
Term of patent 14 years
Int. Cl. D23—*04*
U.S. Cl. D23—155



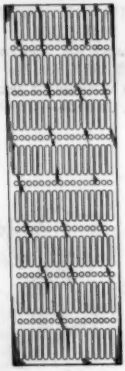
253,966
CONTROL APPARATUS FOR DISPENSING BLOOD OR THE LIKE
Vito Cellini, 3115 Old Ranch Rd., San Antonio, Tex. 78217
Filed Apr. 3, 1978, Ser. No. 892,680
Term of patent 14 years
Int. Cl. D24—*01, 99*
U.S. Cl. D24—8



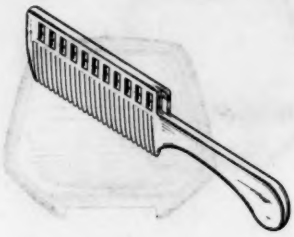
253,967
FOOT MASSAGER OR THE LIKE
Montaro Miyadai, 11-24 Mita 3-chome, Minato-ku, Tokyo, Japan
Filed May 10, 1977, Ser. No. 795,664
Claims priority, application Japan, Nov. 13, 1976, 51-44643
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D24—36



253,968
GRILLE
Robert T. Bogan, P.O. Box 26208, Albuquerque, N. Mex. 87125
Filed Oct. 31, 1977, Ser. No. 847,000
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—90

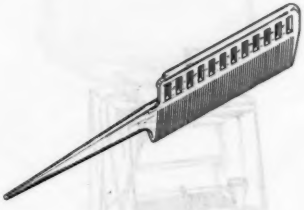


253,969
COMB HAVING A CAVITY FOR HOLDING A NAIL FILE OR THE LIKE
Larry R. Whiteman, 2516 Fallcreek, Arlington, Tex. 76014
Filed Oct. 17, 1977, Ser. No. 843,124
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—25

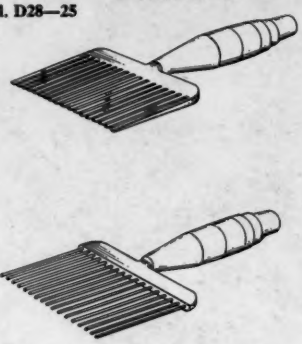


253,970
COMB HAVING A CAVITY FOR HOLDING A NAIL FILE OR THE LIKE
Larry R. Whiteman, 2516 Fallcreek, Arlington, Tex. 76014
Filed Oct. 17, 1977, Ser. No. 843,127
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—25

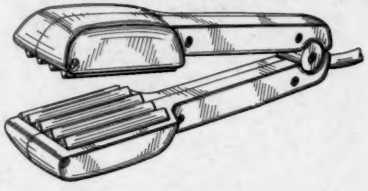
253,971
COMB HAVING A CAVITY FOR HOLDING A NAIL FILE OR THE LIKE
Larry R. Whiteman, 2516 Fallcreek, Arlington, Tex. 76014
Filed Oct. 17, 1977, Ser. No. 843,128
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—25



253,972
COMBINED COMB AND SPRAY ATOMIZER
William E. Haselrig, Ontario, Calif., assignor to Transwestern Sales, Inc., Los Angeles, Calif.
Filed Nov. 4, 1977, Ser. No. 848,779
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—25

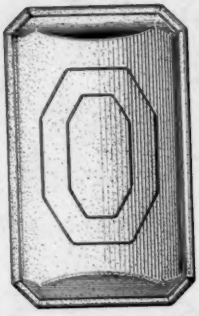


253,973
ELECTRICAL HAIR WAVING APPLIANCE OR SIMILAR ARTICLE
Michel Rosse, Muttenz, Switzerland, assignor to Blitog S.A., Zug, Switzerland
Filed Nov. 7, 1977, Ser. No. 849,484
Claims priority, application Hague, May 24, 1977, 65095 1977, 65095
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—35



253,974
ILLUMINATED TWEEZERS
A. Eugene Nalbandian, Brea, Calif., assignor to Tweezer-Lite, Inc., Brea, Calif.
Filed Nov. 14, 1977, Ser. No. 851,606
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—55

253,975
CASKET FOR ANIMAL OR INFANT
Roy D. Brunson, 4700 Meadowbrook Dr., Fort Worth, Tex. 76103
Filed Aug. 1, 1977, Ser. No. 820,804
Term of patent 14 years
Int. Cl. D3—*01*
U.S. Cl. D99—6



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 15TH DAY OF JANUARY, 1980

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

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Abbott Laboratories: *See*—
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Abbott, Thomas R. Hinge pintle removal tool. 4,183,133, Cl. 29-275.000.

Abe, Masao, to Nihon Beru-Haueru Kabushiki Kaisha. Automatic focus adjusting device. 4,183,640, Cl. 354-25.000.

Abe, Tetsuya: *See*—
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Abramo, Aina L.: *See*—
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Actus, Inc.: *See*—
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Adachi, Shichiro; Takayama, Suguru; and Sato, Takuo, to TDK Electronics Co. Ltd. Catalysts for purification of exhaust gases from internal combustion engines. 4,183,829, Cl. 252-466.0PT.

Adam, Brian D.; and Adam, Douglas G. Base support mount for heat pumps and like machinery. 4,183,495, Cl. 248-558.000.

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Adams, Frank H.; and Knapik, H. Peter G., to UOP Inc. Selectively sulfided acidic multimetallic catalytic composite. 4,183,827, Cl. 252-439.000.

Adler, Franklin P., to Pullman Incorporated. Pressure relief valve. 4,183,370, Cl. 137-68.00R.

Advanced Diagnostic Research Corporation: *See*—
Kopel, LeRoy, 4,184,094, Cl. 310-335.000.

Advanced Simiconductor Materials/America: *See*—
Daly, John K., 4,183,545, Cl. 279-3.000.

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Aeroquip Corporation: *See*—
Olson, Herbert H., 4,184,166, Cl. 346-49.000.

AFA Corporation, The: *See*—
Blake, William S., 4,183,449, Cl. 222-321.000.

Affronti, Victor A. Antenna roof mount for vehicles. 4,184,160, Cl. 343-712.000.

Agence Nationale de Valorisation de la Recherche (ANVAR): *See*—
Macchi nee Danjon, Odile; Levy, Michel; and Macchi, Cesar, 4,184,129, Cl. 333-18.000.
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Ailor, James C., to Cabot Corporation. Methods and apparatus for glass removal. 4,183,769, Cl. 134-6.000.

Air Products and Chemicals, Inc.: *See*—
Ervin, Eugene D.; Kitson, Frederick K.; Krasiewich, David M.; and McWhorter, Thomas E., 4,183,384, Cl. 14-19.000.

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Miyao, Takayuki, 4,183,288, Cl. 91-488.000.
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Hultgren, K. Sten R.; and Sundmar, J. P. Goran, 4,183,281, Cl. 89-47.000.

Albanese, Damian F.; Kennedy, Henry R.; and Goodwin, Jack W., to International Telephone and Telegraph Corporation. Range and angle determining Doppler radar. 4,184,154, Cl. 343-9.00R.

Albrecht, Erhard: *See*—
Leitzke, Ortwin; Cremer, Josef; and Albrecht, Erhard, 4,183,728, Cl. 23-232.00E.

Albrecht, Helmut; Bschorr, Oskar; and Hassel, Helmut, to Messerschmitt-Bolkow-Blohm GmbH. Railway flanged wheel vibration dampening assembly. 4,183,572, Cl. 295-7.000.

Alcaide, Andre, to Etat Francais; and Sous-marins et du Radio. System of audioconference by telephone link up. 4,184,048, Cl. 179-1.0CN.

Allemandou, Philippe M. A.; and Beaudet, Didier M. C., to Societe Anonyme de Telecommunications. Electromechanical filters. 4,184,132, Cl. 333-198.000.

Allemann, James G., to Norris Industries, Inc. Latch bolt locking mechanism for fire door locksets. 4,183,565, Cl. 292-163.000.

Allen Bradley Company: *See*—
Frey, Sydney W., Jr.; and Slagg, James E., 4,184,140, Cl. 338-174.000.

Allen, Richard T.; Moyer, Rudolph H.; Sibbett, Donald J.; Anderson, Howard H.; Martner, Glen R.; and Willis, Don, to Geomet, Incorporated. Method for sampling air in proportion to respiration. 4,183,247, Cl. 73-421.50R.

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Alsenz, Richard H. Method and apparatus for signal transmission in refrigeration units. 4,183,223, Cl. 62-80.000.

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Williams, David E., 4,184,064, Cl. 219-303.000.

Amax Inc.: *See*—
Sherwood, Willam G.; and Queneau, Paul B., 4,183,792, Cl. 204-96.000.

Amburgey, Jay D. Gyrostabilized bowling ball. 4,183,527, Cl. 273-63.00E.

Amerace Corporation: *See*—
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AMP Incorporated: *See*—
Casciotti, Albert; and Zimmerman, Gary L., 4,183,611, Cl. 339-275.00B.
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An, Benjamin J. Natural physiological grip for game rackets. 4,183,528, Cl. 273-75.000.

Anderson, Dale L.: *See*—
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Anderson, Howard H.: *See*—
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Anderson, Jerome E. Device for replacing springs. 4,183,268, Cl. 81-3.00R.

Anderson, Weston A., to Varian Associates, Inc. Lens system for acoustical imaging. 4,183,249, Cl. 73-626.000.

Andersson, Sven A., to Ingenjorsfirman Nils Weibull AB. Method and installation for temperature control in a silo. 4,184,159, Cl. 343-112.00R.

Andrepont, John S.: *See*—
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Anheuser-Busch, Incorporated: *See*—
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Ansel, Robert E.; and Graham, John C., to DeSoto, Inc. Radiation curable oligomers based on tris(2-hydroxyethyl) isocyanurate. 4,183,796, Cl. 204-159.230.

Antonini, Joseph, to Dana Corporation. Hydrodynamic seal with collector bead. 4,183,543, Cl. 277-134.000.

Antos, George J., to UOP Inc. Hydrocarbon conversion with an activated multimetallic catalytic composite. 4,183,804, Cl. 208-139.000.

Antos, George J., to UOP Inc. Hydrocarbon conversion with an attenuated superactive multimetallic catalytic composite. 4,183,805, Cl. 208-139.000.

Aono, Tetsuya; and Kawano, Yasuhiko, to Takeda Chemical Industries, Ltd. Thenoylindan derivatives. 4,183,859, Cl. 549-72.000.

Aoyama, Syunichi, to Nissan Motor Company, Limited. EGR Control system. 4,183,333, Cl. 123-119.00A.

Applebaum, Melvin; De Pas, Len; and Little, William C., to Barkley Studios, Inc. Panoramic photograph album, and method for making the same. 4,183,162, Cl. 40-530.000.

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Asher, William J.; and Vogler, Tina C., to Exxon Research & Engineering Co. Detoxification by means of the controlled, in vivo secretion triggered rupture of liquid membrane capsules. 4,183,960, Cl. 424-365.000.

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Baenens, Victor E. A.; and Thissen, Jan A. L., to Stamicarbon, B.V. Process and device for the biological purification of waste water. 4,183,810, Cl. 210-11.000.

Bagli, Jehan F.; and Bogri, Tibor, to Ayerst. McKenna & Harrison Limited. Troponyl-oxamic acid derivatives for treating allergic conditions. 4,183,955, Cl. 424-320.000.

Baigrie, Brian D.; Bailey, Joseph; Johnston, Linda G.; and Mijovic, Miroslav V., to Eastman Kodak Company. Photographic products and processes employing metal complexed azo dyes. 4,183,753, Cl. 430-17.000.

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Baker, Gerald J.; and Economu, Merle A., to United States of America, National Aeronautics and Space Administration. Air speed and attitude probe. 4,184,149, Cl. 340-177.0VA.

Bald, Hubert, to Maschinenfabrik Alfred Schmermund GmbH & Co. Apparatus in a cigarette plant. 4,183,429, Cl. 198-572.000.

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Balleret, Alain L. C., to Commissariat a l'Energie Atomique; and Balleret, Alain L. C. High-endurance superalloy for use in particular in the nuclear industry. 4,183,774, Cl. 148-31.000.

Balzers Aktiengesellschaft fur Hochvakuumtechnik und Dunne Schichten: *See*—
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Bance, Jean A., to Roper Corporation. Space frame construction system. 4,183,190, Cl. 52-648.000.

Banks, Kenneth A., to Tree Top, Inc. Continuous flow system for equalizing the moisture content of moisture absorbing fruit products. 4,183,292, Cl. 99-468.000.

Bancs, Jean; Cantagrel, Jean-Claude; Cahuzac, Georges; and Darrieux, Jean-Louis, to Societe Nationale Industrielle Aero-Spatiale. Method and machine for three-dimensional weaving for obtaining woven hollow reinforcements of revolution. 4,183,232, Cl. 66-11.000.

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Noteisz, Ferenc; Bartok, Mihaly; Felfoldi, Karoly; Karpati, Egon; and Szporny, Laszlo, 4,184,040, Cl. 546-342.000.
Barton, William M., Jr.; and Gray, Martin D., to Cipher Data Products, Incorporated. File protect and amount of tape sensing apparatus. 4,184,180, Cl. 360-60.000.
Bartuska, William R.; and Silverman, Paul, to Helene Curtis Industries, Inc. Henna hair coloring and/or conditioning compositions. 4,183,366, Cl. 132-7.000.
Basch, E. Evert; and Beaudette, Richard A., to GTE Laboratories Incorporated. Fault locating system for optical telecommunications. 4,184,056, Cl. 179-175.30F.
BASF Aktiengesellschaft: *See*—
Binnig, Fritz; Friedrich, Ludwig; Hofmann, Hans P.; Kreiskott, Horst; Mueller, Claus; and Raschack, Manfred, 4,183,935, Cl. 424-256.000.
Patsch, Manfred; and Hettche, Albert, 4,183,851, Cl. 260-239.900.
Rotter, Gerhard; and Roos, Roland H. W., 4,184,178, Cl. 360-27.000.
BASF Wyandotte Corporation: *See*—
Balko, Edward N.; Argade, Shyam D.; and Shrewsburg, James E., 4,183,793, Cl. 204-98.000.
Langdon, William K.; and Camp, Ronald L., 4,183,821, Cl. 252-331.000.
Bastian, Jean-Michel, to Sandoz Ltd. Organic compounds. 4,183,943, Cl. 424-275.000.
Battelle Development Corporation: *See*—
Garr, Hans; and Hoffman, Ulrich, 4,183,725, Cl. 432-13.000.
Battiste, David R., to SCM Corporation. Diphosphonic acids and esters of para-menthane. 4,183,879, Cl. 260-932.000.
Bauakademie der Deutschen Demokratischen Republik: *See*—
Eisel, Ursula, 4,183,731, Cl. 44-10.00C.
Bauman, William C.: *See*—
Lee, John M.; and Bauman, William C., 4,183,900, Cl. 423-157.000.
Bauriedel, Hans; and Hasenkamp, Rainer, to Henkel Kommanditgesellschaft auf Aktien (Henkel KGaA). Process of solvent-free lamination using isocyanate/amine adhesives. 4,184,005, Cl. 428-420.000.
Baxamusa, Yusuf A.; and Robota, Stephen, to Hooker Chemicals & Plastics Corp. Liquid phase fluorination process. 4,183,873, Cl. 260-651.00F.
Baxter, Charles A. R.; and Shroot, Braham, to Pfizer Inc. 7-Aminophenylacetamido-Δ^3-cephem antibacterial agents and method of use. 4,183,925, Cl. 424-246.000.
Bayer Aktiengesellschaft: *See*—
Buchel, Karl H.; Kramer, Wolfgang; Plempel, Manfred; and Haller, Ingo, 4,183,940, Cl. 424-273.00R.
Enders, Edgar; Stendel, Wilhelm; and Voege, Herbert, 4,183,913, Cl. 424-45.000.
Hamprecht, Rainer; Hartmann, Alfons; Klauke, Erich; Hammann, Ingeborg; Roessler, Peter; and Brandes, Wilhelm, 4,183,949, Cl. 424-304.000.
Kohler, Egon, 4,183,880, Cl. 260-970.000.
Naumann, Klaus; Behrenz, Wolfgang; Hammann, Ingeborg; Klauke, Erich; and Marhold, Albrecht, 4,183,950, Cl. 424-305.000.
Sasse, Klaus; Beck, Gunther; Eue, Ludwig; and Schmidt, Robert R., 4,183,742, Cl. 71-92.000.
Schroeder, Josef; and Schellhammer, Carl-Wolfgang, 4,183,853, Cl. 260-239.650.
BBC Aktiengesellschaft Brown, Bovery & Cie: *See*—
Haferkamp, Dirk; Hodzic, Alija; Moser, Paul; and Prasch, Dieter, 4,183,784, Cl. 176-60.000.
Beale, William T.; Wood, James G.; and Gedeon, David R., to Sunpower, Inc. Spring and resonant system for free-piston Stirling engines. 4,183,214, Cl. 60-520.000.
Beard, Lloyd R.; and Goe, Melvin B., Jr., to A. B. Chance Company. Offset, series connected current limiting fuse and expulsion fuseholder assembly for opengate cutout. 4,184,138, Cl. 337-168.000.
Beaty, Robert C.; and Mansfield, Gerald R., to Corning Glass Works. Control system for a slide centrifuge. 4,183,973, Cl. 427-2.000.
Beaudet, Didier M. C.: *See*—
Allemandou, Philippe M. A.; and Beaudet, Didier M. C., 4,184,132, Cl. 333-198.000.
Beaudette, Richard A.: *See*—
Basch, E. Evert; and Beaudette, Richard A., 4,184,056, Cl. 179-175.30F.
Beck, Gunther: *See*—
Sasse, Klaus; Beck, Gunther; Eue, Ludwig; and Schmidt, Robert R., 4,183,742, Cl. 71-92.000.
Becker, Christian F.: *See*—
Barrett, Edward E.; Lensky, Albert; Olesen, Paul; Becker, Christian F.; Pinczewski, Morris; Febre, Wilfredo; and Hahn, Steven, 4,183,453, Cl. 227-131.000.
Beckers, Hans; Jung, Paul-Werner; Bovians, Herbert; Heyer, Johann M., deceased (by Heyer, Adele, heir); Heyer, Hans P., heir; and Wanders, Marlene, heir, to Robert Bosch GmbH. Method for production of candies from a strand of confection. 4,183,968, Cl. 426-512.000.
Beecham Inc.: *See*—
Rodon, Maria, 4,183,916, Cl. 424-54.000.
Begin, Louis E.; Broersma, Robert J., Jr.; Dickerson, George D.; and Dunbar, Joseph E., to Dow Chemical Company, The. Substituted phenylthioalkylamines and compositions thereof. 4,183,927, Cl. 424-248.500.
Behrenz, Wolfgang: *See*—
Naumann, Klaus; Behrenz, Wolfgang; Hammann, Ingeborg; Klauke, Erich; and Marhold, Albrecht, 4,183,950, Cl. 424-305.000.
Bekoto: *See*—
Destouches, Bernard M. R.; and Esther, Gilbert, 4,183,325, Cl. 119-37.000.
Belanger, Inc.: *See*—
Belanger, James A., 4,183,183, Cl. 51-334.000.
Belanger, James A., to Belanger, Inc. Pack unit and mounting means therefor. 4,183,183, Cl. 51-334.000.
Bell & Howell Company: *See*—
Martija, Henry M., 4,183,475, Cl. 242-68.300.
Suwa, Michiharu, 4,183,639, Cl. 354-25.000.
Bell, Lon E.; and Diller, Robert W., to Technar, Incorporated. Fast acting thermal relay. 4,184,136, Cl. 337-141.000.
Bell Telephone Laboratories, Incorporated: *See*—
Bloom, David M.; and Mollenauer, Linn F., 4,183,795, Cl. 204-157.10R.
Crochiere, Ronald E.; and Tribolet, Jose M. N. S., 4,184,049, Cl. 179-1.05A.
Panish, Morton B., 4,184,171, Cl. 357-18.000.
Bell, William W. Utensil and tool holder. 4,183,439, Cl. 211-60.00T.
Bell, William W., Jr.; and Bussjager, Rudy C., to Carrier Corporation. Combination tube sheet and baffle. 4,183,401, Cl. 165-159.000.
Bellucci, Arturo: *See*—
Stacchiotti, Giuseppe; and Bellucci, Arturo, 4,184,095, Cl. 310-366.000.
Beloit Corporation: *See*—
Chance, James L.; and Hergert, Richard E., 4,183,149, Cl. 34-41.000.
Flohr, Gary R., 4,184,204, Cl. 364-471.000.
Beltran, Adrian M.: *See*—
Schilling, William F.; Beltran, Adrian M.; and Muth, Myron C., 4,183,456, Cl. 228-175.000.
Belyaev, Sergei M.: *See*—
Petrovsky, Viktor A.; Gassanov, Lev G.; Belyaev, Sergei M.; Kochetov, Lev A.; Kryzhanovsky, Vitaly L.; Palamarchuk, Andrei A.; Timraleev, Rafail J.; Ushakov, Viktor D.; and Parfenjuk, Vitaly M., 4,184,156, Cl. 343-8.000.
Bendix Corporation, The: *See*—
Brown, Arthur K., 4,183,421, Cl. 180-145.000.
Vick, Ralph L., 4,183,375, Cl. 137-625.300.
Benkoe, Elisabeth, executrix: *See*—
Goldfarb, Adolph E.; Benkoe, Erwin, deceased; and Benkoe, Elisabeth, executrix, 4,183,535, Cl. 273-120.00R.
Benkoe, Erwin, deceased: *See*—
Goldfarb, Adolph E.; Benkoe, Erwin, deceased; and Benkoe, Elisabeth, executrix, 4,183,535, Cl. 273-120.00R.
Bennett, George J., to United States of America, Navy. Variable volume depth control. 4,183,316, Cl. 114-331.000.
Benoit, Pierre-Alain; and Widmer, Gilbert, to Societe d'Exploitation des Cables Electriques; S.A. des Cableries et Trefileries de Cossonay; and Kabelwerke Brugg AG. Connector for connecting two groups of optical fibres. 4,183,616, Cl. 350-96.200.
Benson, James A.: *See*—
Bentley, Donald J.; and Benson, James A., 4,183,357, Cl. 128-283.000.
Benstead, Bryan C.; and Seith, Robert T., to Gulf States Paper Corporation. Reinforced fabric and laminate made therewith. 4,183,993, Cl. 428-253.000.
Bentley, Donald J.; and Benson, James A., to Bentley Laboratories, Inc. Chronic transcutaneous implant assembly for enterostomies. 4,183,357, Cl. 128-283.000.

Bentley Laboratories, Inc.: *See—*
Bentley, Donald J.; and Benson, James A., 4,183,357, Cl. 128-283.000.

Berdan, Gunter H., to Custom Rollforming Company Limited. Corner piece for a double glazed window construction. 4,183,693, Cl. 403-295.000.

Bergamini, Giorgio, to Nuovo Pignone S.p.A. Method for checking banknotes and apparatus therefor. 4,184,081, Cl. 250-556.000.

Bergwerksverband GmbH: *See—*
Romey, Ingo, 4,183,802, Cl. 208-88.000.

Bernacki, Stephen E.: *See—*
Raffel, Jack I.; and Bernacki, Stephen E., 4,184,172, Cl. 357-50.000.

Bernat, Georg, to ITT Industries, Inc. Single handle mixing faucet. 4,183,377, Cl. 137-625.170.

Bernstein, Seymour: *See—*
Conrow, Ransom B.; and Bernstein, Seymour, 4,183,929, Cl. 424-249.000.

Bertelli, Aldo, to Seuref A.G. Benzoic acid derivatives and therapeutic composition containing the same. 4,183,954, Cl. 424-319.000.

Besenmatter, Walter; Kurz, Gunter; Metzler, Otto; and Muszumanski, Trude, to Vockenhuber, Karl; and Hauser, Raimund. Projection system. 4,183,636, Cl. 353-101.000.

Bessy & Sohn G.m.b.H. & Co.: *See—*
Enz, Erhard, 4,183,513, Cl. 269-203.000.

Biasotti, Joseph B.: *See—*
Vartanian, Paul F.; and Biasotti, Joseph B., 4,183,732, Cl. 44-62.000.

Bielomatik Leuze & Co., Firma: *See—*
Klingelhofer, Hannsgeorg; and Mann, Fridrich, 4,183,193, Cl. 53-450.000.

Biletch, Harry A.; Route, Rodney; and Zomlefer, Jack, to Solar Chemical Corporation. High impact polystyrene resin. 4,183,878, Cl. 525-86.000.

Billitzer, Edward P.: *See—*
DeParales, Lawrence T.; and Billitzer, Edward P., 4,183,443, Cl. 220-90.400.

Bilow, Norman, to Hughes Aircraft Company. Ethynyl-terminated epoxy resin derivatives and process for making the same. 4,183,869, Cl. 260-573.000.

Binnig, Fritz; Friedrich, Ludwig; Hofmann, Hans P.; Kreiskott, Horst; Mueller, Claus; and Raschack, Manfred, to BASF Aktiengesellschaft. Bispidine derivatives, their preparation, and drugs containing same. 4,183,935, Cl. 424-256.000.

Bione, Angelo A.; and Sauvey, Donald R., to Marmon Company. Pedal teaching aid for an electronic musical instrument. 4,183,276, Cl. 84-1.030.

Bjork, Anders K. K.; Abramo, Aina L.; Hernestam, Sven E. H.; and Kjellberg, Bengt E. S., to AB Ferrosan. Diarylbutyl octahydropyrazinopyrimidinones and methods of medical treatment using them. 4,183,933, Cl. 424-251.000.

Black, Donald S.; and Palmer, J. Bruce, to Palmer Engineering Company Ltd. Mixture concentrator. 4,183,813, Cl. 210-512.00R.

Blaetterlein, Matthias, to Timex Corporation. Method for making straps. 4,183,986, Cl. 428-160.000.

Blair, Edgar A., to Monster Molding, Ltd. Method of rotational molding about plural axes at low rotational speeds. 4,183,883, Cl. 264-40.100.

Blake, William S., to AFA Corporation, The. Manually operated miniature atomizer. 4,183,449, Cl. 222-321.000.

Blakey, Philip G.: *See—*
Watson, Richard W.; and Blakey, Philip G., 4,183,906, Cl. 423-392.000.

Bliss, Dan E.: *See—*
Fletcher, Aaron N.; Stanifer, Charles D.; and Bliss, Dan E., 4,184,018, Cl. 429-199.000.

Bloch, Eric. Prosthetic one-way heart valve. 4,183,103, Cl. 3-1.500.

Bloemendaal, John F.; and Boone, Arthur M., to Eastman Kodak Company. Gravity impelled transport for aligning an original in a copier. 4,183,662, Cl. 355-76.000.

Bloom, David M.; and Mollenauer, Linn F., to Bell Telephone Laboratories, Incorporated. Creation of F_2^+ color centers. 4,183,795, Cl. 204-157.10R.

Blum, Jacques M.; and Ventre, Edmond, to Electricite de France (Service National) Pechiney Ugine-Kuhlmann. Method for positioning moderator structure for the core of a molten-salt reactor. 4,183,785, Cl. 176-84.000.

Blunck, Otto H. Nondispersive infrared gas analysis device. 4,184,074, Cl. 250-345.000.

BOC Limited: *See—*
Watson, Richard W.; and Blakey, Philip G., 4,183,906, Cl. 423-392.000.

Bochumer Eisenhutte Heintzmann GmbH: *See—*
von Klinggraff, Gerhard; Bohnes, Karlheinz; Kunzer, Heinz; and Marr, Peter, 4,183,700, Cl. 405-291.000.

Boeing Company, The: *See—*
Rudolph, Peter K. C., 4,183,478, Cl. 244-110.00B.

Bogert, Robert C.: *See—*
Rudy, Marion F., 4,183,156, Cl. 36-44.000.

Bogri, Tibor: *See—*
Bagli, Jehan F.; and Bogri, Tibor, 4,183,955, Cl. 424-320.000.

Bohner, Beat: *See—*
Rohr, Otto; Pissiotas, Georg; and Bohner, Beat, 4,183,743, Cl. 71-100.000.

Bohnes, Karlheinz: *See—*
von Klinggraff, Gerhard; Bohnes, Karlheinz; Kunzer, Heinz; and Marr, Peter, 4,183,700, Cl. 405-291.000.

Bolex International SA: *See—*
Dorig, Franz, 4,183,635, Cl. 352-141.000.

Bollinger, Wayne A., to Monsanto Company. Method of cutting hollow filaments embedded in resinous mass. 4,183,890, Cl. 264-139.000.

Bom, Cornelis J. G.: *See—*
van der Lely, Ary; and Bom, Cornelis J. G., 4,183,468, Cl. 239-665.000.

Bondoc, A. A., to GAF Corporation. Method of producing glass mats using novel glass fiber dispersion composition. 4,183,782, Cl. 162-156.000.

Bone, Arnold R., to Dennison Manufacturing Company. Attaching device. 4,183,567, Cl. 292-318.000.

Bonnel, Michel G., to Societe Colmant Cuvelier Dodge. Storage and extraction device for powdered products. 4,183,702, Cl. 406-56.000.

Bonnie Enterprises, Inc.: *See—*
Cousins, Sydne, 4,183,121, Cl. 24-204.000.

Bonsack, James P., to SCM Corporation. Chlorination of ilmenite and the like. 4,183,899, Cl. 423-79.000.

Boone, Arthur M.: *See—*
Bloemendaal, John F.; and Boone, Arthur M., 4,183,662, Cl. 355-76.000.

Booth, Thomas A.; and Scholten, Frank L., to AM International, Inc. Exposure control system for photocomposition machines. 4,183,638, Cl. 354-7.000.

Borello, Domenic. Dual surface angular power transfer wheel traction nipping device. 4,183,253, Cl. 74-193.000.

Borg-Warner Corporation: *See—*
Wentworth, Robert S., Jr., 4,183,541, Cl. 277-88.000.

Borman, Willem F. H., to General Electric Company. Melt polymerization process for increasing the molecular weight of poly(1,4-butylene terephthalate). 4,184,033, Cl. 528-309.000.

Borner, Alfred. Articulated toy. 4,183,166, Cl. 46-1.00R.

Bosserman, David A., to United States of America, Army. Orthogonal array faceplate wafer tube display. 4,184,069, Cl. 250-213.0VT.

Boston, Melvin C. Cultivator with vertically and sidewardly movable hoes. 4,183,413, Cl. 172-646.000.

Bourquin, Daniel T., to Bourquin Design and Mfg., Inc. Weed puller apparatus. 4,183,411, Cl. 171-58.000.

Bourquin Design and Mfg., Inc.: *See—*
Bourquin, Daniel T., 4,183,411, Cl. 171-58.000.

Bouvin, Jacques; and Jahan, Christian C., to Exxon Research & Engineering Co. Heat pump. 4,183,227, Cl. 62-480.000.

Bovians, Herbert: *See—*
Beckers, Hans; Jung, Paul-Werner; Bovians, Herbert; Heyer, Johann M., deceased; Heyer, Hans P., heir; and Wanders, Marlene, heir, 4,183,968, Cl. 426-512.000.

Bowie Mfg. Co.: *See—*
Greene, Roger F.; and Clark, Gordon F., 4,183,596, Cl. 312-333.000.

Bozung, Hanns-Gunther, to Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft (MAN). Composite impeller wheel with improved centering of one component on the other. 4,183,719, Cl. 416-183.000.

Bradley, Arthur; and Coles, Roger J., to American Cyanamid Company. Synthesis of erythromycin ethyl carbonate. 4,184,038, Cl. 536-9.000.

Bramwell, Frank, to United Technologies Corporation. Pivotal joint with redundant connecting means between the two pivotally joined parts thereof. 4,183,687, Cl. 403-11.000.

Brandes, Wilhelm: *See—*
Hamprecht, Rainer; Hartmann, Alfons; Klauke, Erich; Hammann, Ingeborg; Roessler, Peter; and Brandes, Wilhelm, 4,183,949, Cl. 424-304.000.

Braner Enterprises, Inc.: *See—*
Greinke, James G.; Matsunaga, Douglas S.; and Mosquera, Eric W., 4,183,273, Cl. 83-479.000.

Brantley, James W., to United States of America, Air Force. Composite fan blade platform double wedge centrifugal seal. 4,183,720, Cl. 416-193.00A.

Breant, Pierre L. V.: *See—*
Ferrieu, Gilbert M. M.; and Breant, Pierre L. V., 4,184,150, Cl. 340-347.0DD.

Brendel, Hugo, to Metzeler Schaum GmbH. Method for the production of a polymer substrate with a fibrous surface. 4,183,889, Cl. 264-134.000.

Brennan, John T., to Joy Manufacturing Company. Longwall mining machine. 4,183,585, Cl. 299-43.000.

Breuker, Jacobus H.; de Haan, Hubertus N. H.; and Kwant, Pieter B., to Shell Oil Company. Process for preparing hydrocarbons. 4,183,801, Cl. 208-59.000.

Brichima S.p.A.: *See—*
Maggioni, Paolo, 4,183,861, Cl. 260-340.50R.

Bridgestone Liquefied Gas Co. Ltd.: *See—*
Yamamoto, Katsuro, deceased, 4,183,221, Cl. 62-45.000.

Briglia, Donald D., to Veeco Instruments Inc. Substrate clamping technique in IC fabrication processes. 4,184,188, Cl. 361-234.000.

Brimelow, Christopher J. B.; and Brittain, John E., to Societe d'Assistance Technique Pour Produits Nestle S.A. Continuous food impregnation. 4,183,963, Cl. 426-321.000.

British Petroleum Company Limited, The: *See—*
Groszek, Aleksander J.; Parkes, Colin W.; and Windle, Denis, 4,183,757, Cl. 106-14.110.

British Steel Corporation: *See—*
Payne, Geoffrey, 4,183,305, Cl. 110-173.00A.

Brittain, John E.: *See—*
Brimelow, Christopher J. B.; and Brittain, John E., 4,183,963, Cl. 426-321.000.

Bro, Per: *See*—
Kelsey, G. Stephen; Dey, Arabinda N.; and Bro, Per, 4,184,017, Cl. 429-197.000.

Brock, Waine T.; and Katzer, Wayne E., to Chrysler Corporation. Low ratio engine mounting. 4,183,496, Cl. 248-638.000.

Brockmuller, Friedrich-Franz; Feldkamper, Richard; and Meyer, Erwin, to Windmoller & Holscher. Apparatus for separating in groups a predetermined number of continuously fed flat workpieces overlapping in scale formation. 4,183,518, Cl. 271-182.000.

Brodersen, Hardy G., to Brokenspar Inc.; and Vihos, George. Evacuated mount for display objects. 4,183,160, Cl. 40-152.000.

Broersma, Robert J., Jr.: *See*—
Begin, Louis E.; Broersma, Robert J., Jr.; Dickerson, George D.; and Dunbar, Joseph E., 4,183,927, Cl. 424-248.500.

Brokenspar Inc.: *See*—
Brodersen, Hardy G., 4,183,160, Cl. 40-152.000.

Broodman, Johannus J., to B.V.Koninklijke Maatschappij "De Schelde". Method for welding by pressure one or more pipes to a plate in one process. 4,183,558, Cl. 285-189.000.

Brooksby, Brian T.: *See*—
Simpson, Anthony; Peterkin, Stuart M.; Brooksby, Brian T.; and Murray, Harold J., 4,183,534, Cl. 273-105.100.

Browers, Scott D.; and Wiegand, Donald E., to Conwed Corporation. Oil sorbent material made by opening cells of a closed cell foam. 4,183,984, Cl. 428-81.000.

Brown, Arthur K., to Bendix Corporation, The. Steering control for an integrated brake and steering system. 4,183,421, Cl. 180-145.000.

Brown, Boveri & Cie AG: *See*—
Weddigen, Gert; Fischer, Wilfried; Kleinschmager, Herbert; and Haar, Wilhelm, 4,184,013, Cl. 429-104.000.

Brown, Donald K. Tennis training device. 4,183,526, Cl. 273-29.00A.

Brown, Donald S.: *See*—
Kremer, Charles J.; Condo, Albert C.; and Brown, Donald S., 4,183,996, Cl. 428-315.000.

Brown, Edward M.: *See*—
Downing, Neil H.; Brown, Edward M.; and Towns, Edward J., 4,183,450, Cl. 222-455.000.

Brown, Francis B.: *See*—
Erickson, John W.; and Brown, Francis B., 4,183,713, Cl. 415-89.000.

Brown, Gerald D.: *See*—
Grimes, Gary E.; and Brown, Gerald D., 4,183,106, Cl. 4-172.000.

Brown, Jerald E., to Klebanow, Simon. Apparatus for fluid treatment of textiles. 4,183,233, Cl. 68-5.00C.

Brown, Michael J.; Resnick, Bruce M.; and Woodland, James H. R., to GAF Corporation. Fungicidal 1-(alkoxyphenyl)-5-(substituted phenyl) biguanide compounds. 4,183,958, Cl. 424-326.000.

Brown, Robert M. Universal industrial speed nut. 4,183,386, Cl. 151-41.700.

Brown, Robert S.; and Fay, Robert C., to Milliken Research Corporation. Device for scrubbing carpet. 4,183,112, Cl. 15-50.00R.

Brown, Winthrop K., to Texaco Inc. Digital torque meter with reverse rotation and vibration data correction. 4,183,242, Cl. 73-136.00A.

Broyles, Marshall W.; and Schrader, Charles D. Retractable trash spear. 4,183,570, Cl. 294-61.000.

Brunelli, Alessandro: *See*—
Coralli, Giorgio V.; and Brunelli, Alessandro, 4,183,235, Cl. 70-34.000.

Bruning, Armin M.: *See*—
Graham, Richard; Kamp, Eugene L.; Bruning, Armin M.; Gritton, Earl S.; and Azdell, L. Ronald, 4,184,059, Cl. 200-302.000.

Brunner, Felix. Means for controlling the change of thickness of lines of photographically produced briefs producible by the agency of a means for photographic reproduction. 4,183,659, Cl. 355-40.000.

Bryers, Richard W.; and Taylor, Thomas E., to Foster Wheeler Development Corporation. Fast fluidized bed steam generator. 4,183,330, Cl. 122-4.00D.

Bschorr, Oskar: *See*—
Albrecht, Helmut; Bschorr, Oskar; and Hassel, Helmut, 4,183,572, Cl. 295-7.000.

Buchel, Karl H.; Kramer, Wolfgang; Plempel, Manfred; and Haller, Ingo, to Bayer Aktiengesellschaft. Antimycotic imidazolyl-9,10-dihydro-anthracene derivatives. 4,183,940, Cl. 424-273.00R.

Bujese, David P., to Pitney-Bowes, Inc. Timing apparatus in a copier. 4,183,660, Cl. 355-51.000.

Bunker Ramo Corporation: *See*—
Makuch, John A., 4,183,619, Cl. 350-96.210.

Burch, John; and Wells, Paul W., to A-B Electronic Systems Company. Pulse generating circuit means for depth sounder alarm and transmitter. 4,184,142, Cl. 367-112.000.

Burck, Joseph M.: *See*—
Kulesza, Ralph J.; Burck, Joseph M.; and Herbstler, Horst-Dieter, 4,183,533, Cl. 273-101.000.

Burdick, Robert E., to Rolair Systems, Inc. Paper roll transporter. 4,183,710, Cl. 414-671.000.

Burke, Richard J.; and Renholt, George, Jr., to United States of America, Navy. Induction ground mine and firing mechanism therefor. 4,183,301, Cl. 102-13.000.

Burkey, David J.; and Clark, Lawrence, to Armstrong Cork Company. Method of auto-glazing wood. 4,183,977, Cl. 427-199.000.

Burkybile, George L. Hand tool. 4,183,385, Cl. 145-29.00A.

Burnham, Robert D.; Scifres, Donald R.; and Rawson, Eric G., to Xerox Corporation. Light emitting diode. 4,184,170, Cl. 357-17.000.

Burroughs Corporation: *See*—
Yuen, Raymond C.; Menezes, Mark A.; and Stopper, Herbert, 4,183,460, Cl. 235-302.000.

Burroughs Wellcome Co.: *See*—
Wilkinson, Samuel, 4,184,037, Cl. 536-7.000.

Busony, Raymond W.: *See*—
Landfried, Dennis C.; and Busony, Raymond W., 4,183,569, Cl. 292-347.000.

Bussjager, Rudy C.: *See*—
Bell, William W., Jr.; and Bussjager, Rudy C., 4,183,401, Cl. 165-159.000.

C. van der Lely N. V.: *See*—
van der Lely, Ary; and Bom, Cornelis J. G., 4,183,468, Cl. 239-665.000.

Cabot Corporation: *See*—
Ailor, James C., 4,183,769, Cl. 134-6.000.

Cahuzac, Georges: *See*—
Banos, Jean; Cantagrel, Jean-Claude; Cahuzac, Georges; and Darrieux, Jean-Louis, 4,183,232, Cl. 66-11.000.

Calderon, Abel: *See*—
Hecht, Montague J., 4,183,523, Cl. 273-22.000.

Caldwell, Joseph M. Archer's bow with intermediately pivoted limbs. 4,183,345, Cl. 124-24.00R.

Cales, Bernard: *See*—
Reau, Jean-Maurice; Levasseur, Alain; Fouassier, Claude; Cales, Bernard; and Hagenmuller, Paul, 4,184,015, Cl. 429-193.000.

California Institute of Technology: *See*—
Cuk, Slobodan M.; and Middlebrook, Robert D., 4,184,197, Cl. 363-16.000.

Camerik, Eduard, to U.S. Phillips Corporation. Adjusting device for adjusting the position of an optical or opto-electronic component in two directions of adjustment which are perpendicular to each other. 4,183,627, Cl. 350-252.000.

Camp, Ronald L.: *See*—
Langdon, William K.; and Camp, Ronald L., 4,183,821, Cl. 252-331.000.

Campbell, Fannie L.: *See*—
Pines, Arthur N.; Johnson, Gordon C.; and Campbell, Fannie L., 4,184,004, Cl. 428-413.000.

Campbell, Francis R.: *See*—
Barber, Robert J.; and Campbell, Francis R., 4,183,601, Cl. 339-44.00R.

Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence: *See*—
Armstrong, William A., 4,184,009, Cl. 429-27.000.
Kidd, Derek J.; and Goodwin, Leslie B., 4,183,110, Cl. 5-82.00R.

Cannalte, Gary A.; and Ramsland, David G., to Motorola, Inc. Base station feedback reporting system. 4,184,118, Cl. 325-183.000.

Canon Kabushiki Kaisha: *See*—
Murai, Keiichi; and Matsuo, Takehiko, 4,183,748, Cl. 430-135.000.

Cantagrel, Jean-Claude: *See*—
Banos, Jean; Cantagrel, Jean-Claude; Cahuzac, Georges; and Darrieux, Jean-Louis, 4,183,232, Cl. 66-11.000.

Cappel, Bert; Mayer, Peter; Wirz, Burkhardt; and Decker, Peter, to Roland Offsetmaschinenfabrik Faber & Schleicher AG; and Grapho Metronic Mess-und Regeltechnik GmbH & Co. Water cooled ink roller for printing presses. 4,183,298, Cl. 101-348.000.

Cappel, Bert, to Roland Offsetmaschinenfabrik. Device for fitting a blanket on the cylinder of a printing press. 4,183,299, Cl. 101-415.100.

Cardiodyne, Inc.: *See*—
Sibley, Alfred E.; Winsor, Travis W.; and Kinghorn, George F., 4,183,354, Cl. 128-711.000.

Carl Manufacturing Co., Ltd.: *See*—
Mori, Chuzo, 4,183,161, Cl. 40-389.000.

Carlo Erba S.p.A.: *See*—
Doria, Gianfederico; Romeo, Ciriaco; Lauria, Francesco; Corno, Maria L.; Giraldi, Piernicola; and Tibolla, Marcello, 4,183,945, Cl. 424-283.000.
Doria, Gianfederico; Romeo, Ciriaco; Lauria, Francesco; Corno, Maria L.; Giraldi, Piernicola; and Tibolla, Marcello, 4,183,946, Cl. 424-283.000.

Carlock, John T., to Conoco, Inc. Method for the activation of polymer-bound bis(triphenylphosphine)rhodium carbonyl halide hydroformylation catalysts. 4,183,825, Cl. 252-429.00R.

Carlock, John T., to Conoco, Inc. Polymer bound (pentahaptocyclopentadienyl)biscarbonyl rhodium hydroformylation catalyst. 4,183,872, Cl. 260-604.0HF.

Carlson, Walter; Wasserman, Donald; and Asburry, William, to United States of America, Health, Education and Welfare. Multifinger photocell plethysmography system. 4,183,360, Cl. 128-666.000.

Carmet Company: *See*—
Schaffer, Dennis A., 4,183,237, Cl. 72-349.000.

Carmon, Samuel, to International Fertilizer Development Center. Granulation process and products produced thereby. 4,183,738, Cl. 71-50.000.

Carpigiani Bruto Macchine Automatiche S.P.A.: *See*—
Manfroni, Ezio, 4,183,680, Cl. 366-312.000.

Carrier Corporation: *See*—
Bell, William W., Jr.; and Bussjager, Rudy C., 4,183,401, Cl. 165-159.000.
Reynolds, William D., 4,183,455, Cl. 228-170.000.

Carrock, Frederick E.; and Thakker, Mahendra T., to Dart Industries Inc. Method for incorporating nucleating agents in propylene polymers. 4,184,026, Cl. 525-4.000.

Casciotti, Albert; and Zimmerman, Gary L., to AMP Incorporated. Inlaid contact. 4,183,611, Cl. 339-275.00B.

Cassidy, Donald C., to General Motors Corporation. Run-flat tire having internal support means. 4,183,388, Cl. 152-158.000.

Cassinelli, Giuseppe; Arcamone, Federico; and Di Marco, Aurelio, to Farmitalia Carlo Erba S.p.A. Antitumor glycosides, process for their preparation including intermediates therefor and their use. 4,183,919, Cl. 424-180.000.

Castagne, Charles. Device for changing and fixing tools quickly. 4,183,270, Cl. 82-36.00A.

Caterpillar Tractor Co.: *See*—
Fisher, George A.; and Mason, Gary E., 4,183,551, Cl. 280-785.000.
Fratzke, Lawrence F.; and Fuzzell, Joe E., 4,184,146, Cl. 340-52.00F.
Hajek, Thomas J., II; and Henderson, Robert G., 4,183,498, Cl. 251-144.000.
Jackson, George J., 4,183,267, Cl. 74-804.000.

Caton, Michael P. L.; Coffee, Edward C. J.; and Watkins, Gordon L., to May & Baker Limited. Cyclopentane derivatives. 4,183,870, Cl. 260-590.00C.

Ceskoslovenska akademie ved: *See*—
Lim, Drahoslav; Coupek, Jiri; Krivakova, Miroslava; and Pokorny, Svatopluk, 4,184,020, Cl. 521-52.000.
Wichterle, Otto; and Stoy, Artur, 4,183,884, Cl. 264-41.000.

Chadwick, Curt H.; and Raffarin, John E., to GTE Sylvania Incorporated. Translating mechanism. 4,183,483, Cl. 248-421.000.

Chalabian, Jack S., to K-Jack Engineering Company, Inc. Vending machine with removable coin operated mechanism. 4,183,426, Cl. 194-67.000.

Champion International Corporation: *See*—
Thompson, Kenneth P.; and Ihde, Richard C., 4,183,435, Cl. 206-557.000.

Chance, James L.; and Hergert, Richard E., to Beloit Corporation. Web drying roll. 4,183,149, Cl. 34-41.000.

Chapman, Derek D.; Friday, James A.; and Elwood, James, to Eastman Kodak Company. Photographic products and processes employing nondiffusible 1-arylazo-4-isoquinolinol dye-releasing compounds. 4,183,754, Cl. 430-223.000.

Chapman, Derek D.; and Wu, E-Ming, to Eastman Kodak Company. Photographic products and processes employing metal complexable nondiffusible azo dye-releasing compounds. 4,183,755, Cl. 430-213.000.

Chase, Daniel F. Exercising device having operably interconnected primary and secondary pivot arms. 4,183,520, Cl. 272-130.000.

Chattha, Mohinder S., to Ford Motor Company. High solids coating composition adapted for use as automotive topcoat-3. 4,184,025, Cl. 525-161.000.

Chemische Werke Huls Aktiengesellschaft: *See*—
Kalka, Josef; and Winter, Hermann, 4,184,029, Cl. 526-216.000.
Streck, Roland; Zerpner, Dieter; Haag, Horst; and Nordsiek, Karl-Heinz, 4,183,844, Cl. 260-42.150.

Chessin, Hyman; and Seyb, Edgar J., Jr., to M&T Chemicals Inc. Anode bag benefaction. 4,183,789, Cl. 204-43.00T.

Chester, Victor, to General Porcelain Mfg. Co. Composition of a conductive ceramic glaze and method of forming same. 4,183,830, Cl. 252-519.000.

Chevron Research Company: *See*—
Kurkov, Victor P., 4,183,866, Cl. 260-465.600.
Mitchell, David S.; and Sageman, David R., 4,183,800, Cl. 208-8.00R.

Chiba, Iwane: *See*—
Kawasoko, Yoshiaki; Chiba, Iwane; Yamazaki, Noboru; Chiyonobu, Toshimi; and Shikuma, Masao, 4,183,773, Cl. 148-16.000.

Chicago Bridge & Iron Company: *See*—
Stafford, Donald C.; and Andrepont, John S., 4,183,559, Cl. 285-190.000.

Chino, Yasuyoshi: *See*—
Miyaguchi, Akinori; and Chino, Yasuyoshi, 4,183,833, Cl. 260-23.70C.

Chiyonobu, Toshimi: *See*—
Kawasoko, Yoshiaki; Chiba, Iwane; Yamazaki, Noboru; Chiyonobu, Toshimi; and Shikuma, Masao, 4,183,773, Cl. 148-16.000.

Chown, Martin; Horsley, Anthony W.; and Dalgoutte, David G., to International Standard Electric Corporation. Method of joining optical fibers with a link piece. 4,183,737, Cl. 65-4.00A.

Chrysler Corporation: *See*—
Brock, Waine T.; and Katzer, Wayne E., 4,183,496, Cl. 248-638.000.

Chrysler United Kingdom Ltd.: *See*—
Eden, Stephen J. R., 4,183,114, Cl. 15-250.250.

Chung, Kyung-Cho. Slow socket. 4,184,141, Cl. 338-219.000.

Ciba-Geigy Corporation: *See*—
Petitpierre, Jean C., 4,183,553, Cl. 282-27.500.
Radimerski, Paul; and Rusek, Milos, 4,183,868, Cl. 260-573.000.

Cimon, Denis G.: *See*—
Paris, Gerard Y.; Cimon, Denis G.; Bariana, Dilbagh S.; and Fung, Anthony, 4,183,934, Cl. 424-251.000.

Cincinnati Milacron Inc.: *See*—
Kellermann, Arnold L.; McDonald, David I.; and Grone, Robert J., 4,183,979, Cl. 427-211.000.

Cioc, Alexander: *See*—
Kunzel, Werner; Schwadtke, Karl; Cioc, Alexander; Kik, Michael; and Puchta, Rolf, 4,183,981, Cl. 427-242.000.

Cipher Data Products, Incorporated: *See*—
Barton, William M., Jr.; and Gray, Martin D., 4,184,180, Cl. 360-60.000.

Citizen Watch Co. Ltd.: *See*—
Nishimura, Katsuo; Wakabayashi, Hisao; Osaka, Takatoshi; Kume, Kazunari; Ogura, Yasuhiro; and Miya, Yukio, 4,183,629, Cl. 350-334.000.

CJB Developments Limited: *See*—
Leppard, Colin J.; and Leslie, Robert S. E., 4,183,734, Cl. 55-28.000.

Clarion Company Limited: *See*—
Munakata, Daisaburo; and Yoshida, Motomasa, 4,184,115, Cl. 325-25.000.

Clark Control, Inc.: *See*—
Kane, Hugh; and Oellerich, Bruce A., 4,184,134, Cl. 335-198.000.

Clark, Gordon F.: *See*—
Greene, Roger F.; and Clark, Gordon F., 4,183,596, Cl. 312-333.000.

Clark, Lawrence: *See*—
Burkey, David J.; and Clark, Lawrence, 4,183,977, Cl. 427-199.000.

Clark, Michael A. G.; and Underhill, Michael J., to U.S. Philips Corporation. Digital phase comparison apparatus. 4,184,122, Cl. 328-133.000.

Cleveland, Robert M., to Trendler Metal Products, Inc. Swiveled leaf-spring undercarriage for rocking chair. 4,183,494, Cl. 248-628.000.

Clingenpeel, Glenn R., to Storage Technology Corporation. Digital memory providing fixed and variable delays in a TASI system. 4,184,051, Cl. 179-15.0AS.

Coalmet Corporation: *See*—
Dondelewski, Michael A., 4,183,730, Cl. 44-1.0SR.

Coast, John B., to Union Carbide Corporation. Bag folding machine. 4,183,515, Cl. 270-83.000.

Cockerill, Vernon L. Nutritional and therapeutic iron composition and method of making. 4,183,947, Cl. 424-295.000.

Coffee, Edward C. J.: *See*—
Caton, Michael P. L.; Coffee, Edward C. J.; and Watkins, Gordon L., 4,183,870, Cl. 260-590.00C.

Cohen, Arthur; and Cohen, Daniel R., to Gustave Miller. Wheelie skateboard. 4,183,547, Cl. 280-87.04A.

Cohen, Claude, to Aron S.A. Amino derivatives of pyrazolo [1,5-a]s-triazine, and their therapeutic applications. 4,183,930, Cl. 424-429.000.

Cohen, Daniel R.: *See*—
Cohen, Arthur; and Cohen, Daniel R., 4,183,547, Cl. 280-87.04A.

Cohen, Milton J. Male contraceptive device. 4,183,358, Cl. 128-294.000.

Cohen, Sasson; and Fisher, Abraham, to Purdue Frederick Company, The. 1,8-Ethano-5-oxo-octa- and -decahydroquinolines and mydriatic compositions thereof. 4,183,938, Cl. 424-258.000.

Coles, Roger J.: *See*—
Bradley, Arthur; and Coles, Roger J., 4,184,038, Cl. 536-9.000.

Colgate-Palmolive Company: *See*—
Gaffar, Maria C. S.; and Gaffar, Abdul, 4,183,915, Cl. 424-52.000.
Smithies, Barry; and Straw, Alan, 4,183,911, Cl. 424-36.000.
Wixon, Harold E.; and Schreiber, Ronald S., 4,183,815, Cl. 252-8.800.

Colla, Jeannine O., to Johnson Controls, Inc. Temperature sensing resistance device. 4,183,136, Cl. 29-620.000.

Collington, Kenneth T.; Puri, Rishi R.; and Gibson, Peter J., to Fisons Limited. Blowing agent composition. 4,183,822, Cl. 252-350.000.

Columbia Ribbon & Carbon Mfg. Co., Inc.: *See*—
Knabe, Herbert; Schlotzhauer, Allan T.; and Scott, Michael A., 4,184,003, Cl. 428-411.000.

Comerco, Inc.: *See*—
Swain, C. Daniel, 4,183,487, Cl. 248-214.000.

Commissariat a l'Energie Atomique: *See*—
Balleret, Alain L. C., 4,183,774, Cl. 148-31.000.

Compagnie Generale d'Electricite S.A.: *See*—
Reau, Jean-Maurice; Levasseur, Alain; Fouassier, Claude; Cales, Bernard; and Hagenmuller, Paul, 4,184,015, Cl. 429-193.000.

Compagnie Generale des Etablissements Michelin: *See*—
Reiniche, Andre; and Sauvage, Philippe, 4,184,002, Cl. 428-603.000.

Compagnie Generale pour les Developpements Operationnels des Richesses Sous-Marines "C.G. DORIS": *See*—
Lamy, Jacques E., 4,183,697, Cl. 405-170.000.

Compair Industrial Limited: *See*—
Gosling, Martin C., 4,183,714, Cl. 415-112.000.

Compu-Trol, Inc.: *See*—
Crouse, George B., 4,184,113, Cl. 324-102.000.

Comput-A-Sound Corporation: *See*—
Nutting, Donald W.; and Nugent, Steven F., 4,183,632, Cl. 352-17.000.

Concept Inc.: *See*—
Rieselman, Robert H., 4,183,140, Cl. 32-59.000.

Condo, Albert C.: *See*—
Kremer, Charles J.; Condo, Albert C.; and Brown, Donald S., 4,183,996, Cl. 428-315.000.

Connery, James G.; DiNapoli, Louis D.; and Punis, Giancarlo, to Leeds & Northrup Company. Synchronous frequency-to-voltage converter for doppler apparatus. 4,183,245, Cl. 73-194.00A.

Connlab Holdings Limited: *See*—
Darby, Nicholas; and Wolfert, Peter K., 4,183,850, Cl. 260-239.100.

Conoco, Inc.: *See*—
Carlock, John T., 4,183,825, Cl. 252-429.00R.
Carlock, John T., 4,183,872, Cl. 260-604.0HF.
Pilkington, Paul E., 4,183,408, Cl. 166-314.000.

Conrow, Ransom B.; and Bernstein, Seymour, to American Cyanamid Company. Tri-substituted triazines. 4,183,929, Cl. 424-249.000.

Continental Group, Inc., The: *See*—
Erlandson, Paul M., 4,183,441, Cl. 215-12.00R.

LaCross, George D., 4,183,445, Cl. 220-273.000.
Zakarian, Armen, 4,183,115, Cl. 15-302.000.

Continental Pump, Inc.: *See—*
Goff, Melvin J.; and Goff, Gerald W., 4,183,512, Cl. 269-185.000.

Contraves AG: *See—*
Montanarini, Marco, 4,183,490, Cl. 248-291.000.

Conviron, Inc.: *See—*
Kosnoff, Melvin N., 4,184,076, Cl. 250-437.000.

Conwed Corporation: *See—*
Browers, Scott D.; and Wiegand, Donald E., 4,183,984, Cl. 428-81.000.

Cook, Eugene A.; and Gottschlich, Chad F., to Selas Corporation of America. Method for reducing metal oxide formation on a continuous metal sheet in the hot dip coating thereof. 4,183,983, Cl. 427-321.000.

Cook, Gerald H., to Polaroid Corporation. Rear projection viewer having small auxiliary screen. 4,183,634, Cl. 352-104.000.

Coone, Malcolm G., to Lynes, Inc. Wiper, grouting seal and diaphragm apparatus. 4,183,698, Cl. 405-227.000.

Copher, Joseph E.; and Lucas, Arthur B. Adjustable bracket. 4,183,489, Cl. 248-278.000.

Copolymer Rubber & Chemical Corporation: *See—*
Karg, Rudolph F., 4,183,887, Cl. 264-130.000.

Coq B.V.: *See—*
Irik, Gijsbert W.; Marien, Pieter; and Fierst van Wijnandsbergen, Marius F., 4,184,058, Cl. 200-153.00P.

Cor Tech Research Ltd.: *See—*
Vasishth, Ramesh C., 4,184,032, Cl. 528-139.000.

Coralli, Giorgio V.; and Brunelli, Alessandro, to Viro Innocenti S.p.A. Protected padlock. 4,183,235, Cl. 70-34.000.

Coran, Aubert Y.; and Patel, Raman, to Monsanto Company. Thermoplastic compositions of polyalkenamer rubber and polyolefin resin. 4,183,876, Cl. 525-232.000.

Corning Glass Works: *See—*
Beaty, Robert C.; and Mansfield, Gerald R., 4,183,973, Cl. 427-2.000.

Corno, Maria L.: *See—*
Doria, Gianfederico; Romeo, Ciriaco; Lauria, Francesco; Corno, Maria L.; Giraldi, Piernicola; and Tibolla, Marcello, 4,183,945, Cl. 424-283.000.
Doria, Gianfederico; Romeo, Ciriaco; Lauria, Francesco; Corno, Maria L.; Giraldi, Piernicola; and Tibolla, Marcello, 4,183,946, Cl. 424-283.000.

Corsi, George L.; and Smith, Stanley N., to Federal-Mogul Corporation. Method of working a shaft seal. 4,183,892, Cl. 264-263.000.

Costruzioni Meccaniche G. Mazzoni S.p.A.: *See—*
Lanteri, Agostino, 4,183,897, Cl. 422-197.000.

Cotter, Ray W., to Union Carbide Corporation. Heat exchanger headering arrangement. 4,183,402, Cl. 165-175.000.

Coucher, Robert G.; and Gerek, Gene, to W. R. Grace & Co. Container coating method. 4,183,974, Cl. 427-28.000.

Counselman, Clarence J. Overshoes for spiked shoes. 4,183,157, Cl. 36-135.000.

Coupek, Jiri: *See—*
Lim, Drahoslav; Coupek, Jiri; Krivakova, Miroslava; and Pokorny, Svatopluk, 4,184,020, Cl. 521-52.000.

Cousins, Sydne, to Bonnie Enterprises, Inc. Separable fastener. 4,183,121, Cl. 24-204.000.

Cowdrey, Roy M.: *See—*
Mey, Robert L.; Cowdrey, Roy M.; and Lenhart, John A., 4,183,594, Cl. 312-27.000.

Cox, Arthur: *See—*
Tureck, Albert; and Cox, Arthur, 4,183,644, Cl. 354-77.000.

Cox, Elbert W. Capacitor testing apparatus. 4,184,112, Cl. 324-60.00C.

Crane Co.: *See—*
Skarvada, Thomas, 4,184,203, Cl. 364-426.000.

Crawford, John G.; and Jenkins, Thomas E., to General Electric Company. Rack holder arrangement for dishware. 4,183,437, Cl. 211-41.000.

Crehore, Robert. Wind driven gas generator. 4,184,084, Cl. 290-55.000.

Cremer, Josef: *See—*
Leitzke, Ortwin; Cremer, Josef; and Albrecht, Erhard, 4,183,728, Cl. 23-232.00E.

Cress, Steven B. Heat control apparatus. 4,184,067, Cl. 219-490.000.

Cricchi, James R.: *See—*
Oehler, Harry G.; Herman, David S.; and Cricchi, James R., 4,183,134, Cl. 29-571.000.

Crist, Ralph P. Towed noisemaker. 4,184,209, Cl. 367-1.000.

Crochiere, Ronald E.; and Tribolet, Jose M. N. S., to Bell Telephone Laboratories, Incorporated. Transform speech signal coding with pitch controlled adaptive quantizing. 4,184,049, Cl. 179-1.0SA.

Crossley, Roger, to John Wyeth & Brother Limited. Thiazole compound. 4,183,854, Cl. 260-306.80R.

Crouse, George B., to Compu-Trol, Inc. Method of counting electrical load current pulsations. 4,184,113, Cl. 324-102.000.

Crown, Cork & Seal Company, Inc.: *See—*
Scharf, Jerry F.; and Potts, Vinson S., 4,183,442, Cl. 220-271.000.

Crum, John E.: *See—*
Hersom, Wallace N.; and Crum, John E., 4,184,211, Cl. 363-141.000.

Cubic Western Data: *See—*
Deming, Chandler R., 4,184,179, Cl. 360-44.000.

Cuk, Slobodan M.; and Middlebrook, Robert D., to California Institute of Technology. DC-to-DC switching converter. 4,184,197, Cl. 363-16.000.

Curtis, Robert M., to Shiley Incorporated. Method of oxygenating blood. 4,183,961, Cl. 424-366.000.

Cuscurida, Michael, to Texaco Development Corp. Use of methacrylamide derivative as polyurethane catalyst. 4,184,023, Cl. 521-129.000.

Custom Rollforming Company Limited: *See—*
Berdan, Gunter H., 4,183,693, Cl. 403-295.000.

Daimler-Benz Aktiengesellschaft: *See—*
Forster, Hans-Joachim, 4,183,304, Cl. 104-247.000.
Kinast, Karlheinz; and Wiegard, Klaus, 4,183,396, Cl. 165-9.000.
Klie, Wolfgang; Renner, Hermann; Weidemann, Dieter; and Weishappel, Helmut, 4,183,574, Cl. 296-188.000.
Ohrle, Rolf; and Godel, Richard, 4,183,577, Cl. 296-137.00E.

Dainippon Ink & Chemicals, Inc.: *See—*
Ono, Seibei; Shibuya, Kouichi; and Marikawa, Hiroshi, 4,183,842, Cl. 260-40.00P.

Dalgoutte, David G.: *See—*
Chown, Martin; Horsley, Anthony W.; and Dalgoutte, David G., 4,183,737, Cl. 65-4.00A.

D'Aloia, Andrew, to American Technical Industries, Inc. Door for a mail sorting bin. 4,183,707, Cl. 414-414.000.

Daly, John K., to Advanced Simiconductor Materials/America. Rotary vacuum-chuck using no rotary union. 4,183,545, Cl. 279-3.000.

Dana Corporation: *See—*
Antonini, Joseph, 4,183,543, Cl. 277-134.000.
Osenbaugh, Carl D., 4,183,263, Cl. 74-606.00R.

Danos, James C.; and Heider, Robert J., to Monsanto Company. Methods of cutting patted hollow filaments. 4,183,283, Cl. 90-11.00C.

Danowski, Rudolph J., to United States of America, Navy. Filled composition containing phenol-aldehyde resin and butadiene-acrylonitrile polymer. 4,183,841, Cl. 260-38.000.

Darby, Nicholas; and Wolfert, Peter K., to Connlab Holdings Limited. Process for preparing 2-acyloxymethylpenams and 3-acyloxycephams. 4,183,850, Cl. 260-239.100.

Dare Pafco, Inc.: *See—*
Sidders, Jerry F., 4,183,975, Cl. 427-50.000.

Darrieux, Jean-Louis: *See—*
Banos, Jean; Cantagrel, Jean-Claude; Cahuzac, Georges; and Darrieux, Jean-Louis, 4,183,232, Cl. 66-11.000.

Dart Industries Inc.: *See—*
Carrock, Frederick E.; and Thakker, Mahendra T., 4,184,026, Cl. 525-4.000.

Datafile Limited: *See—*
Barber, Donald T.; and Anderson, Dale L., 4,183,779, Cl. 156-361.000.

Davis, Earl K.; Hansen, Kent W.; Taylor, Scot W.; and Wentworth, Robert M., to Motorola, Inc. Capacitive pressure sensor and method of making it. 4,184,189, Cl. 361-283.000.

Davis, James W., to Union Carbide Corporation. Composition and method for coating metal surfaces. 4,183,772, Cl. 148-6.160.

Davis, Paul, to Sweetheart Plastics, Inc. Food container with integral dish and cover. 4,183,446, Cl. 220-306.000.

de Bruyne, Norman A. Mechanism for effecting orbital motion of a member. 4,183,677, Cl. 366-209.000.

Decker, Bert J. Light weight vacuum maintained structures. 4,183,378, Cl. 138-149.000.

Decker, Peter: *See—*
Cappel, Bert; Mayer, Peter; Wirz, Burkhardt; and Decker, Peter, 4,183,298, Cl. 101-348.000.

Deere & Company: *See—*
Henn, John I.; and Pfundstein, Donald K., 4,183,419, Cl. 180-243.000.

De France, Robert V., to Fargo Manufacturing Company, Inc. Dead end connector. 4,183,686, Cl. 403-11.000.

de Haan, Hubertus N. H.: *See—*
Breuker, Jacobus H.; de Haan, Hubertus N. H.; and Kwant, Pieter B., 4,183,801, Cl. 208-59.000.

Dekkers, Leo P.: *See—*
Stewart, John H.; and Dekkers, Leo P., 4,183,119, Cl. 24-16.0PB.

Dellinger, Eugene L.; and Loubier, Robert J. Method and apparatus for treating malocclusion. 4,183,141, Cl. 32-66.000.

De Macedo, Pedro Buarque: *See—*
Macedo, Pedro B.; Samanta, Mrinmay; and Simmons, Joseph H., 4,183,620, Cl. 350-96.300.

De Marco, Alexander H. Specialty glove. 4,183,100, Cl. 2-159.000.

De Marco, John, Jr., to Twelve Pocket Billiard-Pool, Inc. Pocket billiard table. 4,183,525, Cl. 273-12.000.

Deming, Chandler R., to Cubic Western Data. Reproduction of binary signals from a recording medium that may be read at varying speeds. 4,184,179, Cl. 360-44.000.

Denman, Stephen A. Coupling device for glass or metal parts. 4,184,000, Cl. 428-347.000.

Dennison Manufacturing Company: *See—*
Bone, Arnold R., 4,183,567, Cl. 292-318.000.
Paradis, Joseph R., 4,183,894, Cl. 264-291.000.
Stewart, John H.; and Dekkers, Leo P., 4,183,119, Cl. 24-16.0PB.
Vandervalk, Casey S., 4,184,167, Cl. 346-75.000.

Dent, Robert K. Combination tube fixed to a shank or nipple. 4,183,694, Cl. 403-320.000.

Denton, Howard M. Light-ray indicator. 4,183,667, Cl. 356-250.000.

DeParales, Lawrence T.; and Billitzer, Edward P. Reusable cup cover. 4,183,443, Cl. 220-90.400.

De Pas, Len: *See—*
Applebaum, Melvin; De Pas, Len; and Little, William C., 4,183,162, Cl. 40-530.000.

DeRidder, Alvin H. Boot protection and antitheft apparatus. 4,183,573, Cl. 296-166.000.

Deshmukh, Arvind D. Enzymatically hydrolyzable, serum-soluble cholesterol compounds and method for their preparation. 4,183,847, Cl. 260-112.00R.
DeSoto, Inc.: *See—*
Ansel, Robert E.; and Graham, John C., 4,183,796, Cl. 204-159.230.
Wood, Donald C.; and McLaughlin, Robert L., 4,183,959, Cl. 424-358.000.
Destouches, Bernard M. R.; and Esther, Gilbert, to Bekoto. Egg incubator. 4,183,325, Cl. 119-37.000.
Deussner, Herbert, to Klockner-Humboldt Deutz Aktiengesellschaft. Method for multi-step calcination of cement clinker. 4,183,762, Cl. 106-100.000.
Dey, Arabinda N.; and Him, James H., to P. R. Mallory & Co. Inc. Method for preventing explosion in thionyl chloride depolarizer cells. 4,184,010, Cl. 429-50.000.
Dey, Arabinda N., to P. R. Mallory & Co. Inc. Abuse resistant cells containing fluid depolarizers. 4,184,014, Cl. 429-105.000.
Dey, Arabinda N.: *See—*
Kelsey, G. Stephen; Dey, Arabinda N.; and Bro, Per, 4,184,017, Cl. 429-197.000.
Diamond, Julius; and Zalipsky, Jerome J., to William H. Rorer, Inc. Method for treating gastrointestinal spasms, gastrointestinal hyperacidity and hypertensive disorders with amidinoureas. 4,183,956, Cl. 424-322.000.
DiCara, Alphonse J.: *See—*
May, William A.; Fernandez, Ivan R.; Donohue, Patrick P.; and DiCara, Alphonse J., 4,183,970, Cl. 426-583.000.
Dickerson, George D.: *See—*
Begin, Louis E.; Broersma, Robert J., Jr.; Dickerson, George D.; and Dunbar, Joseph E., 4,183,927, Cl. 424-248.500.
Dickson, Lawrence J. Hyperbolic geometry model. 4,183,153, Cl. 35-34.000.
Dieken, Laurel M.: *See—*
Mickle, James B., deceased; Smith, Wanda J.; and Dieken, Laurel M., 4,183,966, Cl. 426-42.000.
Diller, Robert W.: *See—*
Bell, Lon E.; and Diller, Robert W., 4,184,136, Cl. 337-141.000.
Di Marco, Aurelio: *See—*
Cassinelli, Giuseppe; Arcamone, Federico; and Di Marco, Aurelio, 4,183,919, Cl. 424-180.000.
DiNapoli, Louis D.: *See—*
Connery, James G.; DiNapoli, Louis D.; and Punis, Giancarlo, 4,183,245, Cl. 73-194.00A.
Dion-Biro, Guy. Fire-fighting nozzle assembly having two discharge conduits. 4,183,410, Cl. 169-25.000.
Director of National Aerospace Laboratory of Science and Technology Agency, Toshio Kawasaki, The: *See—*
Takahara, Kitao; Nose, Hiroyuki; Sasaki, Makoto; and Sakata, Kimio, 4,183,716, Cl. 416-96.00A.
Dobras, Bruce W., to Monarch Marking Systems, Inc. Record and printing member for making the record. 4,183,465, Cl. 235-494.000.
Dolby, Dale P., to Ampex Corporation. Field replaceable heads for magnetic tape machine. 4,184,183, Cl. 360-107.000.
Dolby Laboratories, Inc.: *See—*
Dolby, Ray M., 4,184,055, Cl. 179-100.30R.
Dolby, Ray M., to Dolby Laboratories, Inc. Scanning system for reproduction of optical sound tracks with clear area noise discriminator delay means. 4,184,055, Cl. 179-100.30R.
Donaldson Company, Inc.: *See—*
Wagner, Wayne M., 4,183,122, Cl. 24-277.000.
Donan, David C., Jr.; and Donan, David M. Washer/gasket for mine roof bolt assembly. 4,183,699, Cl. 405-259.000.
Donan, David M.: *See—*
Donan, David C., Jr.; and Donan, David M., 4,183,699, Cl. 405-259.000.
Donarummo, Robert. Extension cord lock. 4,183,603, Cl. 339-75.00P.
Dondelewski, Michael A., to Coalmet Corporation. Hydrodesulfurization of coal with hydrogen peroxide in brine solution. 4,183,730, Cl. 44-1.0SR.
Doner, Claude E.: *See—*
Grill, Gerald P.; and Doner, Claude E., 4,184,123, Cl. 330-56.000.
Donn, Edward S.; and Lippman, Michael D., to Fluke Trendar Corporation. Tester for microprocessor-based systems. 4,183,459, Cl. 235-302.000.
Donohue, Patrick P.: *See—*
May, William A.; Fernandez, Ivan R.; Donohue, Patrick P.; and DiCara, Alphonse J., 4,183,970, Cl. 426-583.000.
Doria, Gianfederico; Romeo, Ciriaco; Lauria, Francesco; Corno, Maria L.; Giraldi, Piernicola; and Tibolla, Marcello, to Carlo Erba S.p.A. Substituted 2-vinyl-chromones and process for their preparation. 4,183,945, Cl. 424-283.000.
Doria, Gianfederico; Romeo, Ciriaco; Lauria, Francesco; Corno, Maria L.; Giraldi, Piernicola; and Tibolla, Marcello, to Carlo Erba S.p.A. Substituted 2-vinyl-chromones and process for their preparation. 4,183,946, Cl. 424-283.000.
Dorig, Franz, to Bolex International SA. Motion-picture camera with long-term exposure. 4,183,635, Cl. 352-141.000.
Dotson, Ronald L.: *See—*
Lynch, Richard W.; and Dotson, Ronald L., 4,183,907, Cl. 423-474.000.
Dow Chemical Company, The: *See—*
Begin, Louis E.; Broersma, Robert J., Jr.; Dickerson, George D.; and Dunbar, Joseph E., 4,183,927, Cl. 424-248.500.
Gieske, Thomas H.; and Shea, Philip J., 4,183,939, Cl. 424-258.000.
Lee, John M.; and Bauman, William C., 4,183,900, Cl. 423-157.000.
Pawloski, Chester E., 4,183,957, Cl. 424-326.000.
Steiner, Edwin C., 4,183,862, Cl. 260-340.700.
Downing, Neil H.; Brown, Edward M.; and Towns, Edward J., to Downing, Neil Hugh. Metering device. 4,183,450, Cl. 222-455.000.
Downing, Neil Hugh: *See—*
Downing, Neil H.; Brown, Edward M.; and Towns, Edward J., 4,183,450, Cl. 222-455.000.
Doyle, Walter M., to Laser Precision Corporartion. Dual beam Fourier spectrometer. 4,183,669, Cl. 356-346.000.
Draiswerke GmbH: *See—*
Engels, Kaspar; and Muller, Helmut, 4,183,676, Cl. 366-172.000.
Dreibelbis, Richard C., to Emerson Electric Co. (H & H Precision Products). Thermally actuated phase change operated control valve for heat pump systems. 4,183,466, Cl. 236-1.00C.
Dresser Industries, Inc.: *See—*
Walters, D. F., 4,183,416, Cl. 175-229.000.
Drnevich, Raymond F., to Union Carbide Corporation. Phosphate removal from wastewater. 4,183,808, Cl. 210-5.000.
Ducker, William L., to First National Bank of Lubbock. Adjustable vane windmills. 4,183,715, Cl. 416-41.000.
Dudas, Herminia. Tricycle apparatus. 4,183,418, Cl. 180-216.000.
Dudinyak, Ronald S., to Du Pont de Nemours, E. I., and Company. Process and composition for polymerizing and curing methyl methacrylate monomer-polymer syrups in the presence of metal salts of hemi-peresters of maleic acid. 4,184,030, Cl. 260-872.000.
Dunbar, Joseph E.: *See—*
Begin, Louis E.; Broersma, Robert J., Jr.; Dickerson, George D.; and Dunbar, Joseph E., 4,183,927, Cl. 424-248.500.
Duncan, Charles P. Decorative candle lamp. 4,184,195, Cl. 362-163.000.
Du Pont de Nemours, E. I., and Company: *See—*
Dudinyak, Ronald S., 4,184,030, Cl. 260-872.000.
Luise, Robert R., 4,183,895, Cl. 264-345.000.
Vassiliou. Eustathios, 4,183,998, Cl. 428-327.000.
Wolfe, Harry W., Jr., 4,183,836, Cl. 260-29.2TN.
Durapipe Limited: *See—*
Nash, David D., 4,183,448, Cl. 222-63.000.
Duro Dyne Corporation: *See—*
Hinden, Milton, 4,183,557, Cl. 285-53.000.
Durr, Helmut E., to Western Electric Company, Incorporated. Cable pulling eye. 4,183,692, Cl. 403-275.000.
Dykes, Earl R. Instructional chair. 4,183,154, Cl. 35-73.000.
Eagle Industries, Inc.: *See—*
Morrow, Dennis W., 4,183,709, Cl. 414-563.000.
Eagle-Picher Industries, Inc.: *See—*
Lower, Donald P., 4,183,590, Cl. 308-72.000.
Early, Judson H.: *See—*
Off, Joseph W. A.; and Early, Judson H., 4,183,514, Cl. 270-31.000.
Easley, Wiley L.; Hoeske, Richard J.; and Petrucci, Silvio, to Gillette Company, The. Marbleization of plastic materials. 4,183,673, Cl. 366-76.000.
East Wind Industries, Inc.: *See—*
Melander, Clarence, 4,183,101, Cl. 2-424.000.
Eastman, Fred R. Remotely controlled starting system for model engines. 4,183,341, Cl. 123-179.00A.
Eastman Kodak Company: *See—*
Baigrie, Brian D.; Bailey, Joseph; Johnston, Linda G.; and Mijovic, Miroslav V., 4,183,753, Cl. 430-17.000.
Bloemendaal, John F.; and Boone, Arthur M., 4,183,662, Cl. 355-76.000.
Chapman, Derek D.; Friday, James A.; and Elwood, James, 4,183,754, Cl. 430-223.000.
Chapman, Derek D.; and Wu, E-Ming, 4,183,755, Cl. 430-213.000.
Harris, Willard C., 4,183,519, Cl. 271-245.000.
Harvey, Donald M.; and Wolcott, Dana W., 4,183,648, Cl. 354-135.000.
Locker, David J., 4,183,756, Cl. 430-569.000.
Eastwood, Michael C.; and King, Norman E., to Metal Box Limited. Methods of producing oriented high density polyethylene. 4,183,893, Cl. 264-288.400.
Eaton Corporation: *See—*
Jaskolski, Stanley V.; Lade, Robert W.; Schutten, Herman P.; and Spellman, Gordon B., 4,184,126, Cl. 331-66.000.
Ebauches S.A.: *See—*
Laesser, Claude; Viennet, Rene; and Saurer, Eric, 4,183,628, Cl. 350-338.000.
Eberly, David H., Jr. Thermal powered gas generator. 4,183,218, Cl. 60-673.000.
Ebersberger, Otto, to Siemens Aktiengesellschaft. X-ray diagnostic generator comprising an inverter feeding the high voltage transformer. 4,184,075, Cl. 250-402.000.
Eby, Lawrence T.; and Nelsson, Nels, to United States Gypsum Company. Kerfed edge gypsum board having improved edge strength. 4,183,987, Cl. 428-192.000.
ECKARDT AG: *See—*
Kies, Walter, 4,183,606, Cl. 339-91.00R.
Eckelt, Michael; Heyden, Rudi; Jaeckel, Manfred; Petzold, Manfred; and Worschech, Kurt, to Neynaber Chemie GmbH. Substituted melamine additives useful in molding compositions based on thermosetting resins. 4,183,875, Cl. 525-6.000.
Economu, Merle A.: *See—*
Baker, Gerald J.; and Economu, Merle A., 4,184,149, Cl. 340-177.0VA.
Ecotroleum, Inc.: *See—*
Norman, Juanita, 4,183,336, Cl. 123-119.00B.
Eden, Stephen J. R., to Chrysler United Kingdom Ltd. Rear window wiper mechanism for a motor vehicle. 4,183,114, Cl. 15-250.250.

Ehrke, Rainer, to Rosenmund AG. Heating and air-conditioning system. 4,183,398, Cl. 165-53.000.
Eisel, Ursula, to Bauakademie der Deutschen Demokratischen Republik. Process and apparatus for producing shaped lumps from coke fines or charcoal fines. 4,183,731, Cl. 44-10.00C.
Eiselbrecher, Max; Gunther, Rolf; and Jakob, Helmut, to Messerschmitt-Bolkow-Blohm GmbH. Shackle. 4,183,261, Cl. 74-579.00R.
Eldridge, Jerome M.; Lee, Wen-yaung; and Schwartz, Geraldine C., to International Business Machines Corporation. Stabilization process for aluminum microcircuits which have been reactive-ion etched. 4,183,781, Cl. 156-643.000.
Electric Power Research Institute, Inc.: *See*—
Funk, James E.; and Knickerbocker, Ira O., 4,183,760, Cl. 106-46.000.
Electricite de France (Service National) Pechiney Ugine-Kuhlmann: *See*—
Blum, Jacques M.; and Ventre, Edmond, 4,183,785, Cl. 176-84.000.
Electro-Craft Corporation: *See*—
Fryer, Ronald W.; and Guerra, Jess, 4,184,071, Cl. 250-231.0SE.
Electro-Kinetic Eng./Mfg., Inc.: *See*—
Husbands, Harmon G., 4,183,359, Cl. 128-303.130.
Electrolyser Corporation Ltd., The: *See*—
Janjua, Mohammad B. I.; and LeRoy, Rodney L., 4,183,790, Cl. 204-48.000.
Elitex, Koncern textilniho strojirenstvi: *See*—
Bajer, Frantisek; Nejedly, Josef; and Kral, Milos, 4,183,309, Cl. 112-71.000.
Elixer Industries: *See*—
Frymire, Garold D., 4,183,576, Cl. 296-137.00B.
Elson, Lloyd C. Parachute dropping kite. 4,183,481, Cl. 244-155.00R.
Elwood, James: *See*—
Chapman, Derek D.; Friday, James A.; and Elwood, James, 4,183,754, Cl. 430-223.000.
Emerson Electric Co. (H & H Precision Products): *See*—
Dreibelbis, Richard C., 4,183,466, Cl. 236-1.00C.
Enders, Edgar; Stendel, Wilhelm; and Voege, Herbert, to Bayer Aktiengesellschaft. Ectoparasiticidal compositions and use. 4,183,913, Cl. 424-45.000.
Endo Laboratories, Inc.: *See*—
Rajagopalan, Parthasarathi, 4,183,936, Cl. 424-256.000.
Endo, Tetsuhiko: *See*—
Tanaka, Kenzo; and Endo, Tetsuhiko, 4,183,123, Cl. 28-273.000.
Engel, John F., to FMC Corporation. Insecticidal (β-phenyl-β-substituted-vinyl)cyclopropanecarboxylates. 4,183,942, Cl. 424-274.000.
Engel, Walter O.: *See*—
Hovartos, Theodore; and Engel, Walter O., 4,183,470, Cl. 241-46.00B.
Engelhardt, Bernard; and McKay, Dennis E., to Engelhardt, Bernard. Stock or shipping container. 4,183,436, Cl. 206-622.000.
Engels, Kaspar; and Muller, Helmut, to Draiswerke GmbH. Method of and apparatus for gluing wood chips. 4,183,676, Cl. 366-172.000.
English, Irene F.: *See*—
English, Roy L.; and English, Irene F., 4,183,444, Cl. 220-200.000.
English, Roy L.; and English, Irene F. Lid having integral hanger. 4,183,444, Cl. 220-200.000.
Enz, Erhard, to Bessy & Sohn G.m.b.H. & Co. Clamp wedge. 4,183,513, Cl. 269-203.000.
Epstein, David, to White Sea and Baltic Company Limited, The. Hardenable compositions. 4,183,759, Cl. 106-38.200.
Erben, Edwin; and Koydl, Ladislav, to Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft. Apparatus for nickel plating. 4,183,320, Cl. 118-725.000.
Erickson, John W.; and Brown, Francis B., to Kobe, Inc. Pitot pump with jet pump operated thrust balance. 4,183,713, Cl. 415-89.000.
Erlandson, Paul M., to Continental Group, Inc., The. Container for pressurized products having a security label. 4,183,441, Cl. 215-12.00R.
Ernst, Larry M.; Seigal, Steven D.; and Van Cleave, George W., to International Business Machines Corporation. Dynamic reference for an image quality control system. 4,183,657, Cl. 355-14.00R.
Ernst Leitz Wetzlar GmbH: *See*—
Zwerenz, Dietmar, 4,184,044, Cl. 178-18.000.
Ervin, Eugene D.; Kitson, Frederick K.; Krasiewich, David M.; and McWhorter, Thomas E., to Air Products and Chemicals, Inc. Process and apparatus for blending fluids to maintain concentration of one below a predetermined maximum. 4,183,384, Cl. 14-19.000.
Erwin, John R.: *See*—
Staub, Anthony F.; Staub, Norman T.; and Erwin, John R., 4,183,776, Cl. 156-156.000.
Esanu, Andre, to Societe d'Etudes de Produits Chimiques. Phenothiazine derivatives, their preparation and therapeutic use. 4,183,926, Cl. 424-247.000.
Escher Wyss Ltd.: *See*—
Marchioro, Ignazio, 4,183,128, Cl. 29-116.0AD.
Esenovsky-Lashkov, Jury K.: *See*—
Rumyantsev, Leonid A.; Esenovsky-Lashkov, Jury K.; Lisevich, Anatoly A.; Kanevsky, Jury L.; Steshenko, Vladimir P.; Guba, Vladimir I.; Abramian, Vladimir A.; Tronin, Jury A.; Fedorov, Petr V.; Nazarov, Boris B.; and Mironenko, Mikhail A., 4,183,424, Cl. 192-3.580.
Esoldi, Vincent F., to Raco Inc. Holder arrangement for electrical wiring boxes. 4,183,486, Cl. 248-205.00R.
Esper, Friedrich J.; and Friese, Karl-Hermann, to Robert Bosch GmbH. Stabilized zirconium dioxide compositions and oxygen sensors utilizing said compositions. 4,183,798, Cl. 204-195.00S.
Esther, Gilbert: *See*—
Destouches, Bernard M. R.; and Esther, Gilbert, 4,183,325, Cl. 119-37.000.
Etablissements Francois Salomon et Fils: *See*—
Salomon, Georges P. J., 4,183,549, Cl. 280-632.000.
Etablissements Mesnel: *See*—
Mesnel, Francois, 4,183,778, Cl. 156-245.000.
Etat Francais: *See*—
Alcaide, Andre, 4,184,048, Cl. 179-1.0CN.
Eue, Ludwig: *See*—
Sasse, Klaus; Beck, Gunther; Eue, Ludwig; and Schmidt, Robert R., 4,183,742, Cl. 71-92.000.
Evans, James M.; and Spangler, Walter W., Jr., to Sylvachem Corporation. Ionized rosin-based resinous mixtures as tackifiers for latex. 4,183,834, Cl. 260-27.0BB.
Exxon Production Research Company: *See*—
Lundberg, Robert D.; O'Brien, Dennis E.; Makowski, Henry S.; and Klein, Robert R., 4,183,406, Cl. 166-295.000.
Rickenbacker, James E., 4,184,144, Cl. 367-137.000.
Exxon Research & Engineering Co.: *See*—
Asher, William J.; Li, Norman N.; and Shrier, Adam L., 4,183,918, Cl. 424-94.000.
Asher, William J.; and Vogler, Tina C., 4,183,960, Cl. 424-365.000.
Asher, William J., 4,183,962, Cl. 424-366.000.
Bouvin, Jacques; and Jahan, Christian C., 4,183,227, Cl. 62-480.000.
Li, Norman N.; and Hucal, Taras, 4,183,681, Cl. 366-336.000.
Melchior, Michael T.; Milliman, George E.; and Sartori, Guido, 4,183,903, Cl. 423-226.000.
Fabre, Jean-Louis; Farge, Daniel; and James, Claude, to Rhone Poulenc Industries. Thienothienylcarbonyl-phenylalkanoic acids and derivatives thereof. 4,183,944, Cl. 424-275.000.
Fachbach, Heinz: *See*—
Kirchweger, Karl; Thien, Gerhard; and Fachbach, Heinz, 4,183,344, Cl. 123-198.00E.
Fainzilberg, Leonid S.; and Zhitetsky, Leonid S., to Institut Kibernetiki Akademii Nauk Ukrainskoi SSR. Digital device for checking carbon equivalent in molten iron. 4,183,241, Cl. 73-17.00R.
Fan, You-Ling; and Farnham, Alford G., to Union Carbide Corporation. Silane end-capped polyarylene shaped articles and mixed resins. 4,183,874, Cl. 525-100.000.
Farge, Daniel: *See*—
Fabre, Jean-Louis; Farge, Daniel; and James, Claude, 4,183,944, Cl. 424-275.000.
Farge, Herve, to A.C.R.E.T.-Atelier du Centre de Recherche Etudes et Travaux. Prefabricated modular building. 4,183,185, Cl. 52-79.130.
Fargo Manufacturing Company, Inc.: *See*—
De France, Robert V., 4,183,686, Cl. 403-11.000.
Farm Equipment Company, Inc.: *See*—
Moery, Richard B.; and Roberson, Wayne J., 4,183,690, Cl. 403-59.000.
Farmitalia Carlo Erba S.p.A.: *See*—
Cassinelli, Giuseppe; Arcamone, Federico; and Di Marco, Aurelio, 4,183,919, Cl. 424-180.000.
Farnham, Alford G.: *See*—
Fan, You-Ling; and Farnham, Alford G., 4,183,874, Cl. 525-100.000.
Farrington, Gregory C.; and Weininger, Joseph L., to General Electric Company. Solid ion-conductive electrolyte. 4,183,988, Cl. 429-193.000.
Fawcett, Richard: *See*—
Roesler, Frank C.; Hines, David A.; Maslen, Frank P.; and Fawcett, Richard, 4,183,787, Cl. 435-43.000.
Fay, Robert C.: *See*—
Brown, Robert S.; and Fay, Robert C., 4,183,112, Cl. 15-50.00R.
Febre, Wilfredo: *See*—
Barrett, Edward E.; Lensky, Albert; Olesen, Paul; Becker, Christian F.; Pinczewski, Morris; Febre, Wilfredo; and Hahn, Steven, 4,183,453, Cl. 227-131.000.
Federal-Mogul Corporation: *See*—
Corsi, George L.; and Smith, Stanley N., 4,183,892, Cl. 264-263.000.
Fedorov, Petr V.: *See*—
Rumyantsev, Leonid A.; Esenovsky-Lashkov, Jury K.; Lisevich, Anatoly A.; Kanevsky, Jury L.; Steshenko, Vladimir P.; Guba, Vladimir I.; Abramian, Vladimir A.; Tronin, Jury A.; Fedorov, Petr V.; Nazarov, Boris B.; and Mironenko, Mikhail A., 4,183,424, Cl. 192-3.580.
Feed Pelleting, Inc.: *See*—
Zarow, Albert I., 4,183,675, Cl. 366-144.000.
Feldkamper, Richard: *See*—
Brockmuller, Friedrich-Franz; Feldkamper, Richard; and Meyer, Erwin, 4,183,518, Cl. 271-182.000.
Feldman, Bernard, to Liquidata, Inc. Microscope slide. 4,183,614, Cl. 350-94.000.
Felfoldi, Karoly: *See*—
Noteisz, Ferenc; Bartok, Mihaly; Felfoldi, Karoly; Karpati, Egon; and Szporny, Laszlo, 4,184,040, Cl. 546-342.000.
Fernandez, Ivan R.: *See*—
May, William A.; Fernandez, Ivan R.; Donohue, Patrick P.; and DiCara, Alphonse J., 4,183,970, Cl. 426-583.000.
Ferracane, Hugo F. Lock guard. 4,183,568, Cl. 292-341.180.
Ferrieu, Gilbert M. M.; and Breant, Pierre L. V., to Telecommunications Radioelectriques et Telephoniques TRT. Circuit arrangement for halving the sampling rate of a delta modulation signal. 4,184,150, Cl. 340-347.0DD.

Fichtel & Sachs AG: *See—*
Leiter, Berndt, 4,183,255, Cl. 74-217.00B.
Fierst van Wijnandsbergen, Marius F.: *See—*
Irik, Gijsbert W.; Marien, Pieter; and Fierst van Wijnandsbergen, Marius F., 4,184,058, Cl. 200-153.00P.
Fima, Raoul G., to Jumpak Products, Inc. Brake apparatus using light conductors to control remote wear indicators. 4,184,145, Cl. 340-52.00A.
Finkelstein, Paul: *See—*
Soldati, Gianluigi; Schlichting, David A.; and Finkelstein, Paul, 4,184,039, Cl. 344-12.000.
First National Bank of Lubbock: *See—*
Ducker, William L., 4,183,715, Cl. 416-41.000.
Fischer, Albert K.; and Johnson, Carl E., to United States of America, Energy. Method of foaming a liquid metal. 4,183,744, Cl. 75-20.00F.
Fischer, Wilfried: *See—*
Weddigen, Gert; Fischer, Wilfried; Kleinschmager, Herbert; and Haar, Wilhelm, 4,184,013, Cl. 429-104.000.
Fisher, Abraham: *See—*
Cohen, Sasson; and Fisher, Abraham, 4,183,938, Cl. 424-258.000.
Fisher, George A.; and Mason, Gary E., to Caterpillar Tractor Co. Differential case and push-frame assembly and a method of making same. 4,183,551, Cl. 280-785.000.
Fisons Limited: *See—*
Collington, Kenneth T.; Puri, Rishi R.; and Gibson, Peter J., 4,183,822, Cl. 252-350.000.
West, Peter J.; and Parsons, John H., 4,183,741, Cl. 71-92.000.
Fletcher, Aaron N.; Stanifer, Charles D.; and Bliss, Dan E., to United States of America, Navy. Non-flashing electrolyte for use with calcium anode. 4,184,018, Cl. 429-199.000.
Flohr, Gary R., to Beloit Corporation. Programmable refiner controller. 4,184,204, Cl. 364-471.000.
Fluke Trendar Corporation: *See—*
Donn, Edward S.; and Lippman, Michael D., 4,183,459, Cl. 235-302.000.
Flynn, Cormack; Fredericks, Glen R.; and Hochstetler, Alan R., to Givaudan Corporation. Tobacco compositions flavored with 2-hydroxymethylenecyclohexanones. 4,183,363, Cl. 131-17.00R.
Flynn, Eugene R., to Manville Manufacturing Corporation. Control valve. 4,183,501, Cl. 251-357.000.
FMC Corporation: *See—*
Engel, John F., 4,183,942, Cl. 424-274.000.
Ilardi, Joseph M.; and Rau, Eric, 4,183,901, Cl. 423-206.00T.
Focke & Co.: *See—*
Focke, Heinz, 4,183,191, Cl. 53-225.000.
Focke, Heinz, to Focke & Co. Vacuum holding apparatus for wrapping cigarette packs in blanks. 4,183,191, Cl. 53-225.000.
Fohl, Artur, to Repa Feinstanzwerk GmbH. Wind-up roller for safety belts. 4,183,476, Cl. 242-107.000.
Follick, George E. Versatile all purpose barricade structures. 4,183,317, Cl. 116-63.00P.
Fonderia R. Bertoldo & C. S.a.s.: *See—*
Quartara, Patrizia, 4,183,542, Cl. 277-92.000.
Ford, Frederick. Highway sacrificial barrier. 4,183,504, Cl. 256-13.100.
Ford Motor Company: *See—*
Chattha, Mohinder S., 4,184,025, Cl. 525-161.000.
Kiefer, Edward; and Robertson, Robert B., 4,183,178, Cl. 49-375.000.
Rao, Vemulapalli D. N., 4,183,213, Cl. 60-517.000.
Forenade Fabriksverken: *See—*
Persson, Inge B., 4,183,688, Cl. 403-31.000.
Forster, Hans-Joachim, to Daimler-Benz Aktiengesellschaft. Traffic system for track-guided vehicles with steerable wheels. 4,183,304, Cl. 104-247.000.
Fosdick, Dale P.: *See—*
Rosaen, Borje O.; and Fosdick, Dale P., 4,183,812, Cl. 210-131.000.
Foster Wheeler Development Corporation: *See—*
Bryers, Richard W.; and Taylor, Thomas E., 4,183,330, Cl. 122-4.00D.
Toth, Dennis A., 4,183,308, Cl. 110-263.000.
Fouassier, Claude: *See—*
Reau, Jean-Maurice; Levasseur, Alain; Fouassier, Claude; Cales, Bernard; and Hagenmuller, Paul, 4,184,015, Cl. 429-193.000.
Fratzke, Lawrence F.; and Fuzzell, Joe E., to Caterpillar Tractor Co. Warning system. 4,184,146, Cl. 340-52.00F.
Fredericks, Glen R.: *See—*
Flynn, Cormack; Fredericks, Glen R.; and Hochstetler, Alan R., 4,183,363, Cl. 131-17.00R.
Freeze Sleeves of America, Inc.: *See—*
Moore, Stanley R., 4,183,226, Cl. 62-457.000.
French, James M.; and Thrasher, Samuel R., to General Motors Corporation. Seal heat shield. 4,183,539, Cl. 277-22.000.
Frey, Otto, to Sulzer Brothers Limited. Joint implant. 4,183,104, Cl. 3-1.910.
Frey, Peter: *See—*
Hertel, Hasso; and Frey, Peter, 4,183,727, Cl. 8-46.000.
Frey, Sydney W., Jr.; and Slagg, James E., to Allen Bradley Company. Two-piece trimming potentiometer. 4,184,140, Cl. 338-174.000.
Frezza, Robert, to Samcoe Holding Corporation. High production steamer for tubular knitted fabric or the like. 4,183,151, Cl. 34-155.000.
Friday, James A.: *See—*
Chapman, Derek D.; Friday, James A.; and Elwood, James, 4,183,754, Cl. 430-223.000.
Friedrich, Ludwig: *See—*
Binnig, Fritz; Friedrich, Ludwig; Hofmann, Hans P.; Kreiskott, Horst; Mueller, Claus; and Raschack, Manfred, 4,183,935, Cl. 424-256.000.
Fries, William: *See—*
Meteyer, Thomas E.; and Fries, William, 4,184,019, Cl. 521-34.000.
Friese, Karl-Hermann: *See—*
Esper, Friedrich J.; and Friese, Karl-Hermann, 4,183,798, Cl. 204-195.00S.
Fritz Gegauf Aktiengesellschaft: *See—*
Neuweiler, Armin; and Rickenbach, Jakob, 4,183,473, Cl. 242-20.000.
Fritzche Dodge & Olcott Inc.: *See—*
May, William A.; Fernandez, Ivan R.; Donohue, Patrick P.; and DiCara, Alphonse J., 4,183,970, Cl. 426-583.000.
Frolikov, Ivan I.: *See—*
Piterskikh, Georgy P.; Sukhov, Stanislav A.; Rumyantsev, Ivan I.; Pavlovsky, Lev L.; and Frolikov, Ivan I., 4,183,145, Cl. 34-10.000.
Fromson, Howard A.; and Gracia, Robert F., to Fromson, Howard A. Process for graining an aluminum base lithographic plate and article thereof. 4,183,788, Cl. 430-278.000.
Frye, John S. Thermal induction unit. 4,183,349, Cl. 126-439.000.
Fryer, Ronald W.; and Guerra, Jess, to Electro-Craft Corporation. Modular encoder. 4,184,071, Cl. 250-231.0SE.
Frymire, Garold D., to Elixer Industries. Vehicle sun roof having adjustable seal pressure. 4,183,576, Cl. 296-137.00B.
Fuji Electric Co., Ltd.: *See—*
Kohno, Masaru; Nakagawa, Yukio; and Kada, Takeo, 4,183,244, Cl. 73-194.00A.
Fuji Kasui Engineering Co., Ltd.: *See—*
Hashimoto, Noboru; Senjo, Teizo; and Kobayashi, Makio, 4,183,902, Cl. 423-210.000.
Fuji Photo Film Co., Ltd.: *See—*
Kondo, Toshihiro, 4,183,641, Cl. 354-25.000.
Matsumoto, Nobuo; Tsuji, Osami; and Hamada, Shinji, 4,183,751, Cl. 430-258.000.
Ohmura, Hiroshi; and Shirane, Hideto, 4,183,645, Cl. 354-106.000.
Uchida, Toshio; Yabuta, Yorimiti; Noguchi, Hiroshi; Hasegawa, Eiichi; and Ikeda, Teppei, 4,183,990, Cl. 428-212.000.
Yabe, Kenji; Soda, Atsuhiko; Minami, Satoyuki; and Iida, Osamu, 4,183,749, Cl. 430-211.000.
Yamada, Yasuyuki; and Kitamoto, Tatsuji, 4,183,976, Cl. 427-130.000.
Fujikawa, Kanichi: *See—*
Nishiyama, Ryuzo; Fujikawa, Kanichi; Haga, Takahiro; and Nagatani, Kuniaki, 4,184,041, Cl. 546-345.000.
Fukai, Masakazu: *See—*
Kondo, Shigeo; Yoshiike, Nobuyuki; and Fukai, Masakazu, 4,183,631, Cl. 350-357.000.
Fukui, Yoshiharu: *See—*
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Fukuoka, Kenji, to Olympus Optical Co., Ltd. Automatic focusing devices. 4,183,642, Cl. 354-25.000.
Fukushima, Masanori: *See—*
Nagashima, Eiji; and Fukushima, Masanori, 4,183,132, Cl. 29-451.000.
Funada, Fumiaki; Toda, Kiyoshi; Matsuura, Masataka; and Wada, Tomio, to Sharp Kabushiki Kaisha. Twisted nematic field effect mode liquid crystal display. 4,183,630, Cl. 350-334.000.
Fung, Anthony: *See—*
Paris, Gerard Y.; Cimon, Denis G.; Bariana, Dilbagh S.; and Fung, Anthony, 4,183,934, Cl. 424-251.000.
Funk, James E.; and Knickerbocker, Ira O., to Electric Power Research Institute, Inc. High-strength alumina ceramic product and method of forming. 4,183,760, Cl. 106-46.000.
Funk, Raymond L.: *See—*
Vollhardt, K. Peter C.; and Funk, Raymond L., 4,183,864, Cl. 260-397.300.
Fusco, Robert. Rotary scraper. 4,183,113, Cl. 15-236.00C.
Fuzzell, Joe E.: *See—*
Fratzke, Lawrence F.; and Fuzzell, Joe E., 4,184,146, Cl. 340-52.00F.
G. M. Sommer Company, Inc.: *See—*
Sommer, Gordon M., 4,183,425, Cl. 192-113.00B.
G. W. Dahl Company, Inc.: *See—*
Slawson, Richard S., 4,183,371, Cl. 137-75.000.
GAF Corporation: *See—*
Bondoc, A. A., 4,183,782, Cl. 162-156.000.
Brown, Michael J.; Resnick, Bruce M.; and Woodland, James H. R., 4,183,958, Cl. 424-326.000.
Gaffar, Abdul; and Gaffar, Maria C. S. Magnesium polycarboxylate complexes and anticalculus agents. 4,183,914, Cl. 424-48.000.
Gaffar, Abdul: *See—*
Gaffar, Maria C. S.; and Gaffar, Abdul, 4,183,915, Cl. 424-52.000.
Gaffar, Maria C. S.; and Gaffar, Abdul, to Colgate-Palmolive Company. Stable solution for dental remineralization. 4,183,915, Cl. 424-52.000.
Gaffar, Maria C. S.: *See—*
Gaffar, Abdul; and Gaffar, Maria C. S., 4,183,914, Cl. 424-48.000.
Gageur, Fritz, to Lindauer Dornier Gesellschaft mbH. Equipment for transferring an unstable run of material from a processing machine to a tenter chain. 4,183,451, Cl. 226-91.000.
Gagliani, John, to Long, John V., a part interest. Polyimide resin-forming composition. 4,183,838, Cl. 260-32.6NT.

Gagliani, John, to Long, John V., a part interest. Polyimide resin-forming composition. 4,183,839, Cl. 260-37.00N.
Gaia, Aldino J.; and Urani, Angelo, to McGraw-Edison Company. Dual element fuse protector for electric circuits. 4,184,137, Cl. 337-161.000.
Gallub, Thomas M., to Actus, Inc. Method and position marker for the detection of deep vein thrombosis. 4,183,353, Cl. 128-654.000.
Garcia, Jose R.: *See*—
Iglesias, Benito; and Garcia, Jose R., 4,183,532, Cl. 273-95.00F.
Garnett, John L. Electrophotographic recording element, cellulose carrier irradiated with ionizing radiation, process and product. 4,183,747, Cl. 430-69.000.
Garr, Hans; and Hoffman, Ulrich, to Battelle Development Corporation. Method and apparatus for melting glass in burner-heated tanks. 4,183,725, Cl. 432-13.000.
Garrick, John R., to Armstrong Cork Company. Chemical method for embossing a ceramic acoustical product. 4,183,886, Cl. 264-62.000.
Garsky, Victor M., to American Home Products Corporation. Analgesic polypeptide. 4,183,848, Cl. 260-112.50R.
Gassanov, Lev G.: *See*—
Petrovsky, Viktor A.; Gassanov, Lev G.; Belyaev, Sergei M.; Kochetov, Lev A.; Kryzhanovsky, Vitaly L.; Palamarchuk, Andrei A.; Timraleev, Rafail J.; Ushakov, Viktor D.; and Parfenjuk, Vitaly M., 4,184,156, Cl. 343-8.000.
Gavin, David F.; Milnes, Frank J.; and Parziale, John R., to Olin Corporation. Use of 2,4-di(lower alkyl)-1,2,4-thiadiazolidin-3,5-diones as additives for functional fluids. 4,183,816, Cl. 252-47.500.
Gedeon, David R.: *See*—
Beale, William T.; Wood, James G.; and Gedeon, David R., 4,183,214, Cl. 60-520.000.
Gehle, Richard W., to Rockwell International Corporation. Assembly of microwave integrated circuits having a structurally continuous ground plane. 4,184,133, Cl. 333-238.000.
General Binding Corporation: *See*—
Howard, Crit, Jr., 4,183,554, Cl. 283-7.000.
General Dynamics Pomona Division: *See*—
Schillreff, George H., 4,183,302, Cl. 102-89.0CD.
General Electric Company: *See*—
Barkan, Philip, 4,184,186, Cl. 361-10.000.
Borman, Willem F. H., 4,184,033, Cl. 528-309.000.
Crawford, John G.; and Jenkins, Thomas E., 4,183,437, Cl. 211-41.000.
Farrington, Gregory C.; and Weininger, Joseph L., 4,183,988, Cl. 429-193.000.
Kontis, George E., 4,183,510, Cl. 267-70.000.
Olander, Walter K., 4,184,034, Cl. 528-215.000.
Reed, Bradley O., 4,183,264, Cl. 74-720.500.
Schilling, William F.; Beltran, Adrian M.; and Muth, Myron C., 4,183,456, Cl. 228-175.000.
Shouse, John F., Jr., 4,184,104, Cl. 315-371.000.
General Instrument Corporation: *See*—
Monath, Robert; and Stamm, Russell D., 4,183,250, Cl. 74-10.330.
General Motors Corporation: *See*—
Cassidy, Donald C., 4,183,388, Cl. 152-158.000.
French, James M.; and Thrasher, Samuel R., 4,183,539, Cl. 277-22.000.
General Porcelain Mfg. Co.: *See*—
Chester, Victor, 4,183,830, Cl. 252-519.000.
Geomet, Incorporated: *See*—
Allen, Richard T.; Moyer, Rudolph H.; Sibbett, Donald J.; Anderson, Howard H.; Martner, Glen R.; and Willis, Don, 4,183,247, Cl. 73-421.50R.
George, Zacheria M., to Research Council of Alberta, The. Regeneration process for poisoned claus alumina catalyst. 4,183,823, Cl. 252-411.00S.
Gerek, Gene: *See*—
Coucher, Robert G.; and Gerek, Gene, 4,183,974, Cl. 427-28.000.
Gerrity, Albert B.: *See*—
Vidal, Frederick D.; and Gerrity, Albert B., 4,183,972, Cl. 426-653.000.
Gibson, Peter J.: *See*—
Collington, Kenneth T.; Puri, Rishi R.; and Gibson, Peter J., 4,183,822, Cl. 252-350.000.
Gieske, Thomas H.; and Shea, Philip J., to Dow Chemical Company, The. Glaucine analgesic method. 4,183,939, Cl. 424-258.000.
Giffard, Philip J., to Mineral Deposits Limited. Gravitational separator employing an improved eluent supply system. 4,183,806, Cl. 209-459.000.
Gilbert, Brian, to Lucas Industries Limited. Spark ignition systems for internal combustion engines. 4,183,340, Cl. 123-148.0DS.
Gilbert, Raine M., to United States of America, Army. Fast response electron spectrometer. 4,184,073, Cl. 250-305.000.
Gillette Company, The: *See*—
Easley, Wiley L.; Hoeske, Richard J.; and Petrucci, Silvio, 4,183,673, Cl. 366-76.000.
Gingras, Joel A., Sr.: *See*—
Heffernan, William R.; Vega, Mary-Louise; and Gingras, Joel A., Sr., 4,184,193, Cl. 362-34.000.
Giovachini, Jean-Luc; Pascal, Jean-Pierre; and Vendramini, Dante M., to Institut de Recherche des Transports; and Vendramini, Dante Marc. Wheel structure adapted to spin at high angular velocities and method of manufacturing the same. 4,183,259, Cl. 74-572.000.
Giraldi, Piernicola: *See*—
Doria, Gianfederico; Romeo, Ciriaco; Lauria, Francesco; Corno, Maria L.; Giraldi, Piernicola; and Tibolla, Marcello, 4,183,945, Cl. 424-283.000.
Doria, Gianfederico; Romeo, Ciriaco; Lauria, Francesco; Corno, Maria L.; Giraldi, Piernicola; and Tibolla, Marcello, 4,183,946, Cl. 424-283.000.
Giroux, Victor A.: *See*—
Politte, Leo L.; and Giroux, Victor A., 4,183,225, Cl. 62-114.000.
Givaudan Corporation: *See*—
Flynn, Cormack; Fredericks, Glen R.; and Hochstetler, Alan R., 4,183,363, Cl. 131-17.00R.
Gladieux, Dennis M., to International Harvester Company. Mounting bracket for a cylindrical member. 4,183,485, Cl. 248-68.00R.
Glaubitz, Werner, to Siemens Aktiengesellschaft. Display apparatus having a passive electro-optical display. 4,184,153, Cl. 340-765.000.
Godel, Richard: *See*—
Ohrle, Rolf; and Godel, Richard, 4,183,577, Cl. 296-137.00E.
Goe, Melvin B., Jr.: *See*—
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Goebel, James C.; and Lunn, Anthony C., to American Cyanamid Company. Enhancing the drying of hair by the use of fluorinated catonic and amphoteric surfactants. 4,183,367, Cl. 132-7.000.
Goetzewerke, Friedrich Goetze AG: *See*—
Morsbach, Martin; and Johren, Paul, 4,183,544, Cl. 277-141.000.
Goff, Gerald W.: *See*—
Goff, Melvin J.; and Goff, Gerald W., 4,183,512, Cl. 269-185.000.
Goff, Melvin J.; and Goff, Gerald W., to Continental Pump, Inc. Clamping apparatus. 4,183,512, Cl. 269-185.000.
Goins, Otto K., to Velsicol Chemical Corporation. Process for neutralizing halogenated acid intermediates for polyester production. 4,184,035, Cl. 528-274.000.
Goland, Yaacov; and Long, Ronald M., to Joy Manufacturing Company. Rapping system for electrostatic precipitators. 4,183,735, Cl. 55-112.000.
Gold, Elijah H.; and Solomon, Daniel M., to Schering Corporation. Antipsoriatic compositions. 4,183,923, Cl. 424-241.000.
Goldberg, Richard J. Color film and process for developing it. 4,183,750, Cl. 430-264.000.
Goldfarb, Adolph E.; Benkoe, Erwin, deceased; and by Benkoe, Elisabeth, executrix. Game with inclined surfaces and interceptors. 4,183,535, Cl. 273-120.00R.
Goldsby, Claude W. Simulated brick panel, composition and method. 4,183,188, Cl. 52-596.000.
Golenchenko, Valery A.: *See*—
Vulis, Mikhail L.; Rybin, Igor V.; Shenderovich, Pavel B.; Golenchenko, Valery A.; Shevchenko, Igor S.; and Schedrin, Vladimir G., 4,184,042, Cl. 174-15.00S.
Gonzalez y. Rojas, Enrique M. Doctor's stool. 4,183,579, Cl. 297-195.000.
Good, David M., to Tapecon, Inc. Drive reducer for tape recorder. 4,183,254, Cl. 74-206.000.
Goodwin, Jack W.: *See*—
Albanese, Damian F.; Kennedy, Henry R.; and Goodwin, Jack W., 4,184,154, Cl. 343-9.00R.
Goodwin, Leslie B.: *See*—
Kidd, Derek J.; and Goodwin, Leslie B., 4,183,110, Cl. 5-82.00R.
Gordon, Donald C. Anti-pollution device for exhaust gases. 4,183,896, Cl. 422-168.000.
Gordon, Jason M.: *See*—
Raber, Peter E.; and Gordon, Jason M., 4,183,672, Cl. 356-376.000.
Gorgone, Robert L.: *See*—
Iannadrea, Gerald; and Gorgone, Robert L., 4,183,665, Cl. 356-71.000.
Gosling, Martin C., to Compair Industrial Limited. Lubricant sealing means for a compressor shaft. 4,183,714, Cl. 415-112.000.
Gosudarstvenny Nauchno-Issledovatelsky Energeticheskiy Institut Imeni G.M. Krzhizhanovskogo: *See*—
Vulis, Mikhail L.; Rybin, Igor V.; Shenderovich, Pavel B.; Golenchenko, Valery A.; Shevchenko, Igor S.; and Schedrin, Vladimir G., 4,184,042, Cl. 174-15.00S.
Gotoh, Miyuki, to Nissan Motor Company, Limited. Method of and device for detecting an improper pick of weft yarn in a weaving loom. 4,183,381, Cl. 139-370.100.
Gottlieb, Milton: *See*—
Isaacs, Thelma J.; and Gottlieb, Milton, 4,183,617, Cl. 350-96.120.
Gottschlich, Chad F.: *See*—
Cook, Eugene A.; and Gottschlich, Chad F., 4,183,983, Cl. 427-321.000.
Gracia, Robert F.: *See*—
Fromson, Howard A.; and Gracia, Robert F., 4,183,788, Cl. 430-278.000.
Graham, John: *See*—
Graham, Kenneth; and Graham, John, 4,183,118, Cl. 17-52.000.
Graham, John C.: *See*—
Ansel, Robert E.; and Graham, John C., 4,183,796, Cl. 204-159.230.
Graham, Kenneth; and Graham, John. Oil bag remover. 4,183,118, Cl. 17-52.000.
Graham, Richard; Kamp, Eugene L.; Bruning, Armin M.; Gritton, Earl S.; and Azdell, L. Ronald, to A. B. Chance Company. Encapsulated vacuum switch having improved switch arm seal. 4,184,059, Cl. 200-302.000.
Graham, William H.; and Shepard, Inella G., to Thiokol Corporation. Control of cure rate of polyurethane resins. 4,184,031, Cl. 528-55.000.
Grapho Metronic Mess-und Regeltechnik GmbH & Co.: *See*—
Cappel, Bert; Mayer, Peter; Wirz, Burkhardt; and Decker, Peter, 4,183,298, Cl. 101-348.000.
Grashow, Joseph. Aerial mounting with right angle connection. 4,184,162, Cl. 343-715.000.

Gray, David L.: *See—*
Sandford, Maynard C.; and Gray, David L., 4,184,072, Cl. 250-231.0SE.

Gray, Martin D.: *See—*
Barton, William M., Jr.; and Gray, Martin D., 4,184,180, Cl. 360-60.000.

Green, Michael J.; and Tiberi, Robert, to Schering Corporation. 17α-Chloro-17β-hydrocarbonsulfinyl-1,4-androstadienes and the corresponding 17β-hydrocarbonsulfonyl derivatives and their use as anti-acne agents. 4,183,924, Cl. 424-242.000.

Green, Robert B.; Keller, Richard A.; Luther, Gabriel G.; Schenk, Peter C.; and Travis, John C., to United States of America, Commerce. Frequency stabilized laser. 4,184,127, Cl. 331-94.50S.

Greene, Roger F.; and Clark, Gordon F., to Bowie Mfg. Co. Two way travel drawer slide. 4,183,596, Cl. 312-333.000.

Greenly, Robert B.; Paz, George A.; and Tignanelli, Gerald. Process for making multicolored photographic slides and apparatus therefor. 4,183,663, Cl. 355-77.000.

Grefco, Inc.: *See—*
Nielsen, Richard B., 4,183,980, Cl. 427-215.000.

Greinke, James G.; Matsunaga, Douglas S.; and Mosquera, Eric W., to Braner Enterprises, Inc. Slitter having pivotal multiple spaced pairs of arbors. 4,183,273, Cl. 83-479.000.

Griffin, Brian P.; Jukes, Alan W.; and Wilkins, Cyril S., to Imperial Chemical Industries Limited. Flash fibrillation process. 4,183,881, Cl. 264-13.000.

Grill, Gerald P.; and Doner, Claude E., to RCA Corporation. Double-tuned output circuit for high power devices using coaxial cavity resonators. 4,184,123, Cl. 330-56.000.

Grimes, Gary E.; and Brown, Gerald D., to Grimes, Gary E. Swimming pool lift for the handicapped. 4,183,106, Cl. 4-172.000.

Gritton, Earl S.: *See—*
Graham, Richard; Kamp, Eugene L.; Bruning, Armin M.; Gritton, Earl S.; and Azdell, L. Ronald, 4,184,059, Cl. 200-302.000.

Grone, Robert J.: *See—*
Kellermann, Arnold L.; McDonald, David I.; and Grone, Robert J., 4,183,979, Cl. 427-211.000.

Grosch, Karl A., to Uniroyal GmbH. Heavy duty pneumatic tire. 4,183,389, Cl. 152-361.0FP.

Groszek, Aleksander J.; Parkes, Colin W.; and Windle, Denis, to British Petroleum Company Limited, The. Treatment of underwater surfaces. 4,183,757, Cl. 106-14.110.

Gruber, Heinz; and Keller, Alfred, to Kusters Corporation. Horizontal applicator. 4,183,234, Cl. 68-205.00R.

Grumman Aerospace Corporation: *See—*
Sclafani, Augustus S.; Kirschbaum, Nathan; and Tauby, William C., 4,183,479, Cl. 244-121.000.

Grundig E. M. V. Elektro-Mechanische Versuchsanstalt Max Grundig: *See—*
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GTE Laboratories Incorporated: *See—*
Basch, E. Evert; and Beaudette, Richard A., 4,184,056, Cl. 179-175.30F.

GTE Sylvania Incorporated: *See—*
Chadwick, Curt H.; and Raffarin, John E., 4,183,483, Cl. 248-421.000.

Guba, Vladimir I.: *See—*
Rumyantsev, Leonid A.; Esenovsky-Lashkov, Jury K.; Lisevich, Anatoly A.; Kanevsky, Jury L.; Steshenko, Vladimir P.; Guba, Vladimir I.; Abramian, Vladimir A.; Tronin, Jury A.; Fedorov, Petr V.; Nazarov, Boris B.; and Mironenko, Mikhail A., 4,183,424, Cl. 192-3.580.

Gudmestad, Ragnar; and Kratoska, Thomas J., to Artos Engineering Company. Wire shaping mechanism for production of wire leads. 4,183,383, Cl. 140-105.000.

Guerra, Jess: *See—*
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Guiset, Jacques. Inflatable prosthetic device for lining a body duct. 4,183,102, Cl. 3-1.400.

Gulf States Paper Corporation: *See—*
Benstead, Bryan C.; and Seith, Robert T., 4,183,993, Cl. 428-253.000.

Gummer, Dieter: *See—*
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Gumushan, Hatice, administrator: *See—*
Gumushan, Osman H., deceased; and Gumushan, Hatice, administrator, 4,183,364, Cl. 131-143.000.

Gumushan, Osman H., deceased; and by Gumushan, Hatice, administrator. Tobacco refining process. 4,183,364, Cl. 131-143.000.

Gunson's Sortex Limited: *See—*
Nelson, William B.; and Barnes, Gordon J., 4,183,967, Cl. 426-460.000.

Gunther Papenmeier KG Maschinen-und Apparatebau: *See—*
Kimmel, Hans, 4,183,679, Cl. 366-288.000.

Gunther, Rolf: *See—*
Eiselbrecher, Max; Gunther, Rolf; and Jakob, Helmut, 4,183,261, Cl. 74-579.00R.

Gupta, Kedar P.; and Thousand, J. W., Jr., to Monsanto Company. Breakapart single turn RF induction apparatus. 4,184,135, Cl. 336-62.000.

Gustave Miller: *See—*
Cohen, Arthur; and Cohen, Daniel R., 4,183,547, Cl. 280-87.04A.

Gutridge, Jack E.; Miller, Roy W.; and Marulic, Walter J., to Pullman Incorporated. Sliding door and door guide arrangement for a railway passenger car compartment. 4,183,179, Cl. 49-411.000.

H. Heer & Co.: *See—*
Wyss, Walter, 4,183,560, Cl. 285-232.000.

Haag, Horst: *See—*
Streck, Roland; Zerpner, Dieter; Haag, Horst; and Nordsiek, Karl-Heinz, 4,183,844, Cl. 260-42.150.

Haar, Wilhelm: *See—*
Weddigen, Gert; Fischer, Wilfried; Kleinschmager, Herbert; and Haar, Wilhelm, 4,184,013, Cl. 429-104.000.

Haeussler, Ernst. Multilayer steel-reinforced concrete panels. 4,183,186, Cl. 52-410.000.

Haferkamp, Dirk; Hodzic, Alija; Moser, Paul; and Prasch, Dieter, to Hochtemperatur-Reaktorbau GmbH; and BBC Aktiengesellschaft Brown, Bovery & Cie. Nuclear reactor plant with closed gas coolant circuit. 4,183,784, Cl. 176-60.000.

Haga, Takahiro: *See—*
Nishiyama, Ryuzo; Fujikawa, Kanichi; Haga, Takahiro; and Nagatani, Kuniaki, 4,184,041, Cl. 546-345.000.

Haga, Toshikatsu; Hori, Saburo; and Ito, Yukio, to Kureha Kagaku Kogyo Kabushiki Kaisha. Hot gas recirculation type burning furnace. 4,183,306, Cl. 110-204.000.

Hageman, Carlton V.; and Wise, James C., to Harris Corporation. Apparatus and method for delivering signatures to a gatherer. 4,183,517, Cl. 271-150.000.

Hagemann, Julius. Sonic echo scanning and facsimile recording of water submerged surfaces. 4,184,210, Cl. 367-88.000.

Hagenmuller, Paul: *See—*
Reau, Jean-Maurice; Levasseur, Alain; Fouassier, Claude; Cales, Bernard; and Hagenmuller, Paul, 4,184,015, Cl. 429-193.000.

Haggar Company: *See—*
Off, Joseph W. A.; and Early, Judson H., 4,183,514, Cl. 270-31.000.

Hagiwara, Kazuo: *See—*
Shiomura, Tetsunosuke; Ooka, Tatuo; Kobayashi, Takashi; Hagiwara, Kazuo; and Sadotomo, Hideo, 4,184,036, Cl. 528-499.000.

Hahn, Steven: *See—*
Barrett, Edward E.; Lensky, Albert; Olesen, Paul; Becker, Christian F.; Pinczewski, Morris; Febre, Wilfredo; and Hahn, Steven, 4,183,453, Cl. 227-131.000.

Haines, Kenneth A. Tomographic cross-sectional imaging using incoherent optical processing. 4,183,623, Cl. 350-162.0SF.

Hajek, Thomas J., II; and Henderson, Robert G., to Caterpillar Tractor Co. Draining apparatus for a fluid reservoir. 4,183,498, Cl. 251-144.000.

Haller, Ingo: *See—*
Buchel, Karl H.; Kramer, Wolfgang; Plempel, Manfred; and Haller, Ingo, 4,183,940, Cl. 424-273.00R.

Hallman, Robert W., to B.F. Goodrich Company, The. Puncture-sealing tire. 4,183,390, Cl. 152-347.000.

Hamada, Shinji: *See—*
Matsumoto, Nobuo; Tsuji, Osami; and Hamada, Shinji, 4,183,751, Cl. 430-258.000.

Hamada, Toshihiko; and Okuda, Shiro, to Kubota Tekko Co., Ltd. Hydraulic control apparatus for tractor. 4,183,287, Cl. 91-384.000.

Hamashima, Yoshio; Narisada, Masayuki; Hayashi, Sadao; and Nagata, Wataru. Haloarylmalonamidooxacephalosporins. 4,183,928, Cl. 424-248.520.

Hamashima, Yoshio: *See—*
Yoshioka, Mitsuru; Uyeo, Shoichiro; Tsuji, Teruji; Hamashima, Yoshio; Kikkawa, Ikuo; and Nagata, Wataru, 4,183,855, Cl. 260-307.00F.

Hamermesh, Charles L.: *See—*
United States of America, National Aeronautics and Space Administration; Sawko, Paul M.; Riccitiello, Salvatore R.; and Hamermesh, Charles L., 4,184,021, Cl. 521-106.000.

Hamilton, Stuart: *See—*
Horgan, John J.; and Hamilton, Stuart, 4,183,208, Cl. 60-39.120.

Hamilton, William H. Flush toilet system. 4,183,108, Cl. 4-354.000.

Hammann, Ingeborg: *See—*
Hamprecht, Rainer; Hartmann, Alfons; Klauke, Erich; Hammann, Ingeborg; Roessler, Peter; and Brandes, Wilhelm, 4,183,949, Cl. 424-304.000.
Naumann, Klaus; Behrenz, Wolfgang; Hammann, Ingeborg; Klauke, Erich; and Marhold, Albrecht, 4,183,950, Cl. 424-305.000.

Hamprecht, Rainer; Hartmann, Alfons; Klauke, Erich; Hammann, Ingeborg; Roessler, Peter; and Brandes, Wilhelm, to Bayer Aktiengesellschaft. Pesticidally active 1-arylamino-2,4-dinitronaphthalenes. 4,183,949, Cl. 424-304.000.

Hansen, Bruno A.; and Andresen, Finn H., to Nordisk Insulinlaboratorium. Therapeutic insulin preparation and a process for the production of a stable insulin preparation with protracted effect. 4,183,849, Cl. 260-112.700.

Hansen, Kent W.: *See—*
Davis, Earl K.; Hansen, Kent W.; Taylor, Scot W.; and Wentworth, Robert M., 4,184,189, Cl. 361-283.000.

Hansen, Lowell D.; and Huber, Melvin F., to Sundstrand Corporation. Rotary vane pump having multi-independent outputs due to stator surfaces of different contour. 4,183,723, Cl. 417-204.000.

Hansson, Gert-Ake G.: *See—*
Philipson, Lars H. G.; and Hansson, Gert-Ake G., 4,184,045, Cl. 178-68.000.

Hara, Kunio, to Illinois Tool Works Inc. Thermal cut-off fuse. 4,184,139, Cl. 337-407.000.

Harano, Allen A., to Hughes Aircraft Company. Subpixel X-Y coordinate encoding. 4,184,206, Cl. 364-515.000.

Hardy, Ronald G.: *See*—
Setzer, William C.; Hardy, Ronald G.; and Winter, Joseph, 4,183,771, Cl. 148-2.000.

Hare, Nicholas S.; and Jackson, Miles J. Variable flush toilet valve mechanism. 4,183,107, Cl. 4-324.000.

Harris Corporation: *See*—
Hageman, Carlton V.; and Wise, James C., 4,183,517, Cl. 271-150.000.
Washburn, Clyde, 4,184,068, Cl. 235-92.0CC.

Harris, John F., III, to Western Publishing Company, Inc. Electrical indicating device. 4,183,152, Cl. 35-9.00C.

Harris, Willard C., to Eastman Kodak Company. Sheet registration mechanism. 4,183,519, Cl. 271-245.000.

Hartley, Charlie. Oil derrick string-up apparatus and methods. 4,183,649, Cl. 254-139.100.

Hartmann, Alfons: *See*—
Hamprecht, Rainer; Hartmann, Alfons; Klauke, Erich; Hammann, Ingeborg; Roessler, Peter; and Brandes, Wilhelm, 4,183,949, Cl. 424-304.000.

Hartmann, Clinton S.: *See*—
Norris, Jerry L.; and Hartmann, Clinton S., 4,184,052, Cl. 179-15.00A.

Hartwell Corporation: *See*—
Poe, L. Richard, 4,183,564, Cl. 292-113.000.

Harvey, Donald M.; and Wolcott, Dana W., to Eastman Kodak Company. Synchronizing mechanism for flash firing and shutter actuation. 4,183,648, Cl. 354-135.000.

Hasebe, Mitsuo: *See*—
Umahashi, Minoru; Yamazaki, Hideo; Hasebe, Mitsuo; and Yamashita, Tadashi, 4,183,655, Cl. 355-3.0TR.

Hasegawa, Eiichi: *See*—
Uchida, Toshio; Yabuta, Yorimiti; Noguchi, Hiroshi; Hasegawa, Eiichi; and Ikeda, Teppei, 4,183,990, Cl. 428-212.000.

Hasenkamp, Rainer: *See*—
Bauriedel, Hans; and Hasenkamp, Rainer, 4,184,005, Cl. 428-420.000.

Hashimoto, Hiroshi: *See*—
Yoshizawa, Kiyoshi; Nojiro, Kikuo; Mitsutomi, Katsuyoshi; Hashimoto, Hiroshi; Noguchi, Akira; and Tanno, Kazuo, 4,183,807, Cl. 210-2.000.

Hashimoto, Noboru; Senjo, Teizo; and Kobayashi, Makio, to JGC Corporation; Fuji Kasui Engineering Co., Ltd.; and Sumitomo Metal Industries, Ltd. Wet process for removing specific component from gas. 4,183,902, Cl. 423-210.000.

Hashimoto, Seiichi, to Taiyo Hatsujo Mfg. Co., Ltd. C-shaped retaining ring. 4,183,280, Cl. 85-8.800.

Hassel, Helmut: *See*—
Albrecht, Helmut; Bschorr, Oskar; and Hassel, Helmut, 4,183,572, Cl. 295-7.000.

Hasunuma, Hisao: *See*—
Sudo, Kyosuke; Hasunuma, Hisao; Yamaoka, Takahiro; and Sagae, Shigeru, 4,183,592, Cl. 308-187.200.

Hatta, Tokuaki: *See*—
Hoshino, Yoshiaki; Hatta, Tokuaki; and Sakai, Masahiro, 4,183,761, Cl. 106-69.000.

Haus, Hermann A., to Massachusetts Institute of Technology. Electrical filter of cascaded surface acoustic wave resonators. 4,184,131, Cl. 333-195.000.

Hauser, Raimund: *See*—
Besenmatter, Walter; Kurz, Gunter; Metzler, Otto; and Muszumanski, Trude, 4,183,636, Cl. 353-101.000.

Havaco Incorporated: *See*—
Stevenson, Robert L., 4,183,285, Cl. 91-180.000.

Haveg Industries, Inc.: *See*—
Hildreth, Nelson, 4,184,001, Cl. 428-383.000.

Hayakawa, Kiyoshi: *See*—
Ibaragi, Toshio; Satake, Kunio; Yamada, Tsuyoshi; and Hayakawa, Kiyoshi, 4,183,877, Cl. 525-70.000.

Hayama, Hajime: *See*—
Hinotani, Katsuhiro; Kanatani, Keiichi; Osumi, Masato; and Hayama, Hajime, 4,183,351, Cl. 126-443.000.

Hayashi, Sadao: *See*—
Hamashima, Yoshio; Narisada, Masayuki; Hayashi, Sadao; and Nagata, Wataru, 4,183,928, Cl. 424-248.520.

Hayashi, Toshio, to Toyo Kogyo Co., Ltd. Extensible stay for automobile closures. 4,183,575, Cl. 296-56.000.

Hazemeijer B.V.: *See*—
Oude Aarninkhof, Martinus A., 4,183,598, Cl. 339-6.00R.

Healy, Nigel A.: *See*—
Lownds, Charles M.; and Healy, Nigel A., 4,183,775, Cl. 149-21.000.

Hecht, Montague J., to Calderon, Abel, a part interest. Apparatus for facilitating the performance of billiard shots. 4,183,523, Cl. 273-22.000.

Hedin, Roland C.; and Whitaker, Lawrence R., Jr., to Minnesota Mining and Manufacturing Company. Cartridge with improved access door closing means. 4,184,184, Cl. 360-133.000.

Heenan, Kenneth, to National Research Development Corporation. Improvements in or relating to locking devices for rotary bearings. 4,183,589, Cl. 308-1.00A.

Hefele, Josef, to Kufner Textilwerke KG. Raster-like coating of heat-sealable adhesives on substrates. 4,183,978, Cl. 427-202.000.

Heffernan, William R.; Vega, Mary-Louise; and Gingras, Joel A., Sr., to American Cyanamid Company. Multi-purpose lantern. 4,184,193, Cl. 362-34.000.

Hegarty, William, to Self-Powered Lighting, Ltd. Apparatus for filling glass tubing with pure gas. 4,183,595, Cl. 316-30.000.

Heidelberger Druckmaschinen Aktiengesellschaft: *See*—
Rambausek, Hugo, 4,183,296, Cl. 101-181.000.

Heider, Robert J.: *See*—
Danos, James C.; and Heider, Robert J., 4,183,283, Cl. 90-11.00C.

Heilig, Morton L. Skateboard. 4,183,546, Cl. 280-87.04A.

Heiling, Gerald M.; Knappe, LaVerne F.; and Regehr, John L., to International Business Machines Corporation. Thermal printer write head assembly. 4,184,063, Cl. 219-216.000.

Heimermann, Wilhelm: *See*—
Hofbauer, Peter; Heimermann, Wilhelm; Gummer, Dieter; and Willmann, Michael, 4,183,332, Cl. 123-52.00M.

Helene Curtis Industries, Inc.: *See*—
Bartuska, William R.; and Silverman, Paul, 4,183,366, Cl. 132-7.000.

Hemphill, Geoffrey: *See*—
Skov, Ebbe R.; Judge, Roderick B.; and Hemphill, Geoffrey, 4,183,953, Cl. 424-317.000.

Henderson, Robert G.: *See*—
Hajek, Thomas J., II; and Henderson, Robert G., 4,183,498, Cl. 251-144.000.

Henkel Kommanditgesellschaft auf Aktien: *See*—
Kunzel, Werner; Schwadtke, Karl; Cioc, Alexander; Kik, Michael; and Puchta, Rolf, 4,183,981, Cl. 427-242.000.

Henkel Kommanditgesellschaft auf Aktien (Henkel KGaA): *See*—
Bauriedel, Hans; and Hasenkamp, Rainer, 4,184,005, Cl. 428-420.000.

Henn, John I.; and Pfundstein, Donald K., to Deere & Company. Hydrostatic front wheel drive system. 4,183,419, Cl. 180-243.000.

Herbstler, Horst-Dieter: *See*—
Kulesza, Ralph J.; Burck, Joseph M.; and Herbstler, Horst-Dieter, 4,183,533, Cl. 273-101.000.

Hercules Incorporated: *See*—
Podlas, Thomas J., 4,183,765, Cl. 106-187.000.

Hercules Industries, Inc.: *See*—
Yates, Paul D., 4,183,566, Cl. 292-317.000.

Hergert, Richard E.: *See*—
Chance, James L.; and Hergert, Richard E., 4,183,149, Cl. 34-41.000.

Herman, David S.: *See*—
Oehler, Harry G.; Herman, David S.; and Cricchi, James R., 4,183,134, Cl. 29-571.000.

Hernestam, Sven E. H.: *See*—
Bjork, Anders K. K.; Abramo, Aina L.; Hernestam, Sven E. H.; and Kjellberg, Bengt E. S., 4,183,933, Cl. 424-251.000.

Herron, William L.: *See*—
Odermann, Charles R.; and Herron, William L., 4,183,313, Cl. 112-302.000.

Hersom, Wallace N.; and Crum, John E., to LH Research. Output stage for switching regulated power supply. 4,184,211, Cl. 363-141.000.

Hertel, Hasso; and Frey, Peter, to Hoechst Aktiengesellschaft. Process for the production of water-insoluble azo dyestuffs on the fiber. 4,183,727, Cl. 8-46.000.

Hettche, Albert: *See*—
Patsch, Manfred; and Hettche, Albert, 4,183,851, Cl. 260-239.900.

Heyden, Rudi: *See*—
Eckelt, Michael; Heyden, Rudi; Jaeckel, Manfred; Petzold, Manfred; and Worschech, Kurt, 4,183,875, Cl. 525-6.000.

Heyer, Adele, heir: *See*—
Beckers, Hans; Jung, Paul-Werner; Bovians, Herbert; Heyer, Johann M., deceased; Heyer, Hans P., heir; and Wanders, Marlene, heir, 4,183,968, Cl. 426-512.000.

Heyer, Hans P., heir: *See*—
Beckers, Hans; Jung, Paul-Werner; Bovians, Herbert; Heyer, Johann M., deceased; Heyer, Hans P., heir; and Wanders, Marlene, heir, 4,183,968, Cl. 426-512.000.

Heyer, Johann M., deceased: *See*—
Beckers, Hans; Jung, Paul-Werner; Bovians, Herbert; Heyer, Johann M., deceased; Heyer, Hans P., heir; and Wanders, Marlene, heir, 4,183,968, Cl. 426-512.000.

HIAB-FOCO Aktiebolag: *See*—
Lindberg, Hans E., 4,183,712, Cl. 414-738.000.

Hideshima, Keiji; Sasaki, Naoki; and Takaki, Masaoki, to Hitachi, Ltd.; and Nissan Motor Company, Limited. Fault diagnosis apparatus and method for sequence control system. 4,183,462, Cl. 235-304.000.

High Voltage Engineering Corporation: *See*—
Milde, Helmut I., 4,183,736, Cl. 55-139.000.

Higley, David P.; and Wolf, Philip F., to Union Carbide Corporation. Conversion of cyclohexanol to ϵ-caprolactone. 4,183,863, Cl. 260-343.000.

Hildering, Willem C., to U.S. Philips Corporation. Method of providing spacers on an insulating substrate. 4,184,043, Cl. 174-68.500.

Hildreth, Nelson, to Haveg Industries, Inc. Multi layer insulation system for conductors comprising a fluorinated copolymer layer which is radiation cross-linked. 4,184,001, Cl. 428-383.000.

Him, James H.: *See*—
Dey, Arabinda N.; and Him, James H., 4,184,010, Cl. 429-50.000.

Hinden, Milton, to Duro Dyne Corporation. Insulative flexible connector. 4,183,557, Cl. 285-53.000.

Hines, David A.: *See*—
Roesler, Frank C.; Hines, David A.; Maslen, Frank P.; and Fawcett, Richard, 4,183,787, Cl. 435-43.000.

Hinotani, Katsuhiro; Kanatani, Keiichi; Osumi, Masato; and Hayama, Hajime, to Sanyo Electric Co. Ltd. Solar heat collecting apparatus. 4,183,351, Cl. 126-443.000.

Hinshaw, Waldo S., to National Research Development Corporation. Investigation of samples by N.M.R. techniques. 4,184,110, Cl. 324-0.50R.
Hiratsuka, Shoichi; and Arai, Hideki, to Tokyo Metropolitan Government. Line printer for the raised-dot language of braille characters. 4,183,683, Cl. 400-122.000.
Hirtsiefer, Karl-Richard: *See—*
Wagner, Paul-Heinz; Hirtsiefer, Karl-Richard; and Muller, Johann, 4,183,260, Cl. 74-575.000.
Hitachi, Ltd.: *See—*
Hideshima, Keiji; Sasaki, Naoki; and Takaki, Masaoki, 4,183,462, Cl. 235-304.000.
Ota, Norio; and Ishida, Fumihiko, 4,183,999, Cl. 428-336.000.
Sagawa, Akio; Suzuki, Masayoshi; and Ito, Tetsuo, 4,184,086, Cl. 307-252.00J.
Seya, Seiichi; Omori, Masao; and Sakamoto, Masahide, 4,183,131, Cl. 29-434.000.
Ueyama, Takehiko; Nishizawa, Masahiro; Yamazaki, Eiichi; and Ogura, Iwao, 4,183,637, Cl. 354-1.000.
Hochstetler, Alan R.: *See—*
Flynn, Cormack; Fredericks, Glen R.; and Hochstetler, Alan R., 4,183,363, Cl. 131-17.00R.
Hochtemperatur-Reaktorbau GmbH: *See—*
Haferkamp, Dirk; Hodzic, Alija; Moser, Paul; and Prasch, Dieter, 4,183,784, Cl. 176-60.000.
Hockemeyer, Friedrich; and August, Peter, to Wacker-Chemie GmbH. Process for preparing adhesive repellent coatings and coated article. 4,184,006, Cl. 428-447.000.
Hodzic, Alija: *See—*
Haferkamp, Dirk; Hodzic, Alija; Moser, Paul; and Prasch, Dieter, 4,183,784, Cl. 176-60.000.
Hoechst Aktiengesellschaft: *See—*
Hertel, Hasso; and Frey, Peter, 4,183,727, Cl. 8-46.000.
Lembens, Helmut, 4,184,060, Cl. 430-151.000.
Walch, Axel; and Lammers, Ludwig, 4,183,811, Cl. 210-23.00R.
Hoeske, Richard J.: *See—*
Easley, Wiley L.; Hoeske, Richard J.; and Petrucci, Silvio, 4,183,673, Cl. 366-76.000.
Hofbauer, Peter; Heimermann, Wilhelm; Gummer, Dieter; and Willmann, Michael, to Volkswagenwerk Aktiengesellschaft. Intake system. 4,183,332, Cl. 123-52.00M.
Hoffman, Robert F., to Kisco Company. Method of and apparatus for fabricating spiral wrapped cartridge cases. 4,183,124, Cl. 29-1.300.
Hoffman, Ulrich: *See—*
Garr, Hans; and Hoffman, Ulrich, 4,183,725, Cl. 432-13.000.
Hoffmann, Hermann: *See—*
Theile, Heinz; Hoffmann, Hermann; Rossmy, Gerd; Koerner, Gotz; and Zaske, Peter, 4,183,820, Cl. 252-342.000.
Hofmann, Hans J.; and Jankewitz, Axel, to Schwanhausser & Co. Schwan-Bleistift Fabrik. Ink. 4,183,685, Cl. 401-202.000.
Hofmann, Hans P.: *See—*
Binnig, Fritz; Friedrich, Ludwig; Hofmann, Hans P.; Kreiskott, Horst; Mueller, Claus; and Raschack, Manfred, 4,183,935, Cl. 424-256.000.
Hohnjec, Marijan; and Japelj, Miha, to KRKA, farmacevtika, kemija, kozmetika, zdravilisca in gostinstvo, Novo mesto, n.sol.o. Process for the resolution of racemic α-aminonitriles. 4,183,865, Cl. 260-465.00E.
Hokuren Federation of Agricultural Cooperative Associations, The: *See—*
Yoshizawa, Kiyoshi; Nojiro, Kikuo; Mitsutomi, Katsuyoshi; Hashimoto, Hiroshi; Noguchi, Akira; and Tanno, Kazuo, 4,183,807, Cl. 210-2.000.
Honda Giken Kogyo Kabushiki Kaisha: *See—*
Nishikawa, Masao; and Yamamoto, Hitoshi, 4,183,509, Cl. 267-8.00R.
Hooker Chemicals & Plastics Corp.: *See—*
Baxamusa, Yusuf A.; and Robota, Stephen, 4,183,873, Cl. 260-651.00F.
Hopkins, Byrd, to Monsanto Company. Recycle control system for continuous polymerization. 4,184,027, Cl. 526-60.000.
Horgan, John J.; and Hamilton, Stuart, to United Technologies Corporation. Fluidized bed gasifier. 4,183,208, Cl. 60-39.120.
Hori, Saburo: *See—*
Haga, Toshikatsu; Hori, Saburo; and Ito, Yukio, 4,183,306, Cl. 110-204.000.
Horsley, Anthony W.: *See—*
Chown, Martin; Horsley, Anthony W.; and Dalgoutte, David G., 4,183,737, Cl. 65-4.00A.
Hosaka, Akio: *See—*
Asano, Masaharu; and Hosaka, Akio, 4,183,335, Cl. 123-119.0EC.
Hoshino, Yoshiaki; Hatta, Tokuaki; and Sakai, Masahiro, to Kurosaki Refractories Co., Ltd. Silica bricks and method for manufacturing silica bricks. 4,183,761, Cl. 106-69.000.
Houser, David J.: *See—*
Wiley, Paul F.; and Houser, David J., 4,183,860, Cl. 260-340.300.
Hovartos, Theodore; and Engel, Walter O., to Linder, Lorraine. Water actuated disposer. 4,183,470, Cl. 241-46.00B.
Howard, Crit, Jr., to General Binding Corporation. Semi-laminated security pouch. 4,183,554, Cl. 283-7.000.
Howell Laboratories, Incorporated: *See—*
Peoples, Patrick J., 4,184,082, Cl. 250-572.000.
Howell, William H. Sectional bed. 4,183,109, Cl. 5-60.000.
Hsieh, H. Philip: *See—*
Koenig, James J.; and Hsieh, H. Philip, 4,183,843, Cl. 260-40.00R.
Huber, Calvin O.: *See—*
Schick, Karl G.; and Huber, Calvin O., 4,183,791, Cl. 204-56.00R.
Huber, Melvin F.: *See—*
Hansen, Lowell D.; and Huber, Melvin F., 4,183,723, Cl. 417-204.000.
Hucal, Taras: *See—*
Li, Norman N.; and Hucal, Taras, 4,183,681, Cl. 366-336.000.
Huczek, Richard, to Loblawscompanies Limited. Shelf divider. 4,183,438, Cl. 211-49.00D.
Hudson, John A.; Mazey, David J.; and Nelson, Richard S., to National Research Development Corporation. Radiation toughening of diamonds. 4,184,079, Cl. 250-492.00B.
Huff, Roger K., to Imperial Chemical Industries Limited. Halogenated esters. 4,183,948, Cl. 424-304.000.
Hughes Aircraft Company: *See—*
Bilow, Norman, 4,183,869, Cl. 260-573.000.
Harano, Allen A., 4,184,206, Cl. 364-515.000.
Hughes, Donald W. K., to AMP Incorporated. Connecting means for fine wires. 4,183,607, Cl. 339-97.00R.
Hull, Francis R. Forced circulation steam generator. 4,183,331, Cl. 122-442.000.
Hultgren, K. Sten R.; and Sundmar, J. P. Goran, to Aktiebolaget Bofors. Method of and device for loading a firearm. 4,183,281, Cl. 89-47.000.
Hunter Mfg., Inc.: *See—*
Hunter, William E., 4,183,430, Cl. 198-735.000.
Hunter, William E., to Hunter Mfg., Inc. Grain handling flight conveyor assembly. 4,183,430, Cl. 198-735.000.
Husbands, Harmon G., to Electro-Kinetic Eng./Mfg., Inc. Epilator. 4,183,359, Cl. 128-303.130.
Husted, Gary V. Eave trough flushing system. 4,183,368, Cl. 134-166.00R.
Hynson, Charles D. Football game. 4,183,529, Cl. 273-94.00R.
Hytonen, Kauko. Mechanical shaft seal. 4,183,540, Cl. 277-27.000.
Iannadrea, Gerald; and Gorgone, Robert L., to Ardac, Inc. Apparatus for testing the presence of color in a paper security. 4,183,665, Cl. 356-71.000.
Ibaragi, Toshio; Satake, Kunio; Yamada, Tsuyoshi; and Hayakawa, Kiyoshi, to Asahi Kasei Kogyo Kabushiki Kaisha. High-impact polystyrene composition and production thereof. 4,183,877, Cl. 525-70.000.
ID Code Industries, Inc.: *See—*
Smagala-Romanoff, Edward A., 4,184,148, Cl. 340-149.00A.
Iglesias, Benito; and Garcia, Jose R. Flipper game with adjustable detainer. 4,183,532, Cl. 273-95.00F.
Ignatiev, Anatoly D.: *See—*
Khutoretsky, Garry M.; Vorontsov, Alexandr I.; and Ignatiev, Anatoly D., 4,184,091, Cl. 310-214.000.
Ihde, Richard C.: *See—*
Thompson, Kenneth P.; and Ihde, Richard C., 4,183,435, Cl. 206-557.000.
Iida, Makoto, to Security Patrols Co., Ltd. Automatic fire-extinguishing system. 4,183,409, Cl. 169-11.000.
Iida, Osamu: *See—*
Yabe, Kenji; Soda, Atsuhiko; Minami, Satoyuki; and Iida, Osamu, 4,183,749, Cl. 430-211.000.
Ikeda, Teppei: *See—*
Uchida, Toshio; Yabuta, Yorimiti; Noguchi, Hiroshi; Hasegawa, Eiichi; and Ikeda, Teppei, 4,183,990, Cl. 428-212.000.
Ikeno, Hitoshi; Sugita, Mitsuyuki; and Yanagi, Hirofumi, to Kabushiki Kaisha Seikosha. Process for preparing quartz oscillator. 4,183,126, Cl. 29-25.350.
Ilardi, Joseph M.; and Rau, Eric, to FMC Corporation. Process for crystallization of anhydrous sodium carbonate. 4,183,901, Cl. 423-206.00T.
Illinois Tool Works Inc.: *See—*
Hara, Kunio, 4,184,139, Cl. 337-407.000.
Imahigshi, Naofumi: *See—*
Takahashi, Minoru; Ishii, Osamu; Naito, Masanori; Kusuhara, Yoshinobu; and Imahigshi, Naofumi, 4,183,840, Cl. 260-37.00R.
Imasen Electric Co., Ltd.: *See—*
Naganawa, Masahiro, 4,183,578, Cl. 297-90.000.
Imperial Chemical Industries Limited: *See—*
Griffin, Brian P.; Jukes, Alan W.; and Wilkins, Cyril S., 4,183,881, Cl. 264-13.000.
Huff, Roger K., 4,183,948, Cl. 424-304.000.
Nightingale, Douglas D. J., 4,183,500, Cl. 251-335.00R.
Roesler, Frank C.; Hines, David A.; Maslen, Frank P.; and Fawcett, Richard, 4,183,787, Cl. 435-43.000.
Imura, Toshinori; and Yamanaka, Akira, to Minolta Camera Kabushiki Kaisha. Automatic focusing system for use in camera. 4,183,643, Cl. 354-25.000.
Inaba, Naomi: *See—*
Ueno, Hiroshi; Sezaki, Eiji; Inaba, Naomi; Makishima, Tokuo; Watanabe, Koh; and Wada, Shozo, 4,183,826, Cl. 252-429.00B.
Industries - En Handelsonderneming Bijstede B.V.: *See—*
Van Melle, Leonard, 4,183,691, Cl. 403-109.000.
Ingenieurgesellschaft Kuhbier KG: *See—*
Kuhbier, Manfred; and Kuhbier, Sigrid, 4,183,708, Cl. 414-543.000.
Ingenjorsfirman Nils Weibull AB: *See—*
Andersson, Sven A., 4,184,159, Cl. 343-112.00R.
Ingersoll-Rand Company: *See—*
Pauley, Reginald W., 4,183,265, Cl. 74-786.000.
Inoue, Naoyuki: *See—*
Saito, Shozo; and Inoue, Naoyuki, 4,183,2?8, Cl. 62-497.000.
Institut de Recherche des Transports: *See—*
Giovachini, Jean-Luc; Pascal, Jean-Pierre; and Vendramini, Dante M., 4,183,259, Cl. 74-572.000.

Institut de Recherches de la Siderurgie Francaise: *See*—
Michelet, Jacques; and Zanetta, Hugues, 4,183,508, Cl. 266-242.000.
Institut Kibernetiki Akademii Nauk Ukrainskoi SSR: *See*—
Fainzilberg, Leonid S.; and Zhitetsky, Leonid S., 4,183,241, Cl. 73-17.00R.
Integrated Development and Manufacturing: *See*—
Rule, Adrian O., III; and Bartley, William E., III, 4,183,224, Cl. 62-91.000.
International Business Machines Corporation: *See*—
Eldridge, Jerome M.; Lee, Wen-yaung; and Schwartz, Geraldine C., 4,183,781, Cl. 156-643.000.
Ernst, Larry M.; Seigal, Steven D.; and Van Cleave, George W., 4,183,657, Cl. 355-14.00R.
Heiling, Gerald M.; Knappe, LaVerne F.; and Regehr, John L., 4,184,063, Cl. 219-216.000.
Kennedy, Thomas N.; Lester, William C.; McDonough, George W.; and Michaelsen, John D., 4,183,797, Cl. 204-192.00R.
McKenna, Charles M.; and Willcox, H. Keith, 4,183,780, Cl. 156-643.000.
International Computers Limited: *See*—
Babb, Edward, 4,183,464, Cl. 235-312.000.
International Fertilizer Development Center: *See*—
Carmon, Samuel, 4,183,738, Cl. 71-50.000.
International Flavors & Fragrances Inc.: *See*—
Lindauer, Jerome I.; Munteanu, Marina; Reich, Sharon; and Pelliza, Enrique, 4,184,099, Cl. 313-315.000.
Mookherjee, Braja D.; Trenkle, Robert W.; Vock, Manfred H.; Luccarelli, Domenick, Jr.; Schmitt, Frederick L.; Stork, Gilbert; MacDonald, Timothy; and Liberman, Arthur L., 4,183,965, Cl. 426-548.000.
International Harvester Company: *See*—
Gladieux, Dennis M., 4,183,485, Cl. 248-68.00R.
International Standard Electric Corporation: *See*—
Chown, Martin; Horsley, Anthony W.; and Dalgoutte, David G., 4,183,737, Cl. 65-4.00A.
Taylor, Terrence F. E.; Bansal, Vishwa N.; and Raby, Peter T. C., 4,184,169, Cl. 346-140.00R.
International Telephone and Telegraph Corporation: *See*—
Albanese, Damian F.; Kennedy, Henry R.; and Goodwin, Jack W., 4,184,154, Cl. 343-9.00R.
Kao, Charles K.; and Maklad, Mokhtar S., 4,183,621, Cl. 350-96.300.
Ionics, Inc.: *See*—
Seehausen, Jobst W., 4,183,399, Cl. 165-103.000.
IRD Mechanalysis, Inc.: *See*—
Morrow, Robert S., 4,184,205, Cl. 364-508.000.
Irik, Gijsbert W.; Marien, Pieter; and Fierst van Wijnandsbergen, Marius F., to Coq B.V. Polyphase isolator switches. 4,184,058, Cl. 200-153.00P.
Isaac, Mark. Portable transparent display device. 4,183,159, Cl. 40-1.600.
Isaacs, Thelma J.; and Gottlieb, Milton, to Westinghouse Electric Corp. Thin film As_2S_5 optical wave guide. 4,183,617, Cl. 350-96.120.
Isayama, Takuro; and Sato, Tsutomu, to Ricoh Company, Ltd. Ink-on-demand type ink jet head driving circuit. 4,184,168, Cl. 346-140.00R.
Ishida, Fumihiko: *See*—
Ota, Norio; and Ishida, Fumihiko, 4,183,999, Cl. 428-336.000.
Ishihara Sangyo Kaisha Ltd.: *See*—
Nishiyama, Ryuzo; Fujikawa, Kanichi; Haga, Takahiro; and Nagatani, Kuniaki, 4,184,041, Cl. 546-345.000.
Rohr, Otto; Pissiotas, Georg; and Bohner, Beat, 4,183,743, Cl. 71-100.000.
Ishihara, Toshiaki; Atsumi, Fumitoshi; and Yamada, Tetsuya, to Minolta Camera Kabushiki Kaisha. Slit exposure type copying apparatus. 4,183,656, Cl. 355-8.000.
Ishii, Osamu: *See*—
Takahashi, Minoru; Ishii, Osamu; Naito, Masanori; Kusuhara, Yoshinobu; and Imahigshi, Naofumi, 4,183,840, Cl. 260-37.00R.
Ishikawa, Youhei: *See*—
Nishikawa, Toshio; Tamura, Sadahiro; Ishikawa, Youhei; and Ito, Yoji, 4,184,130, Cl. 333-206.000.
Isobe, Toshinobu: *See*—
Sahara, Hiroshi; Tanaka, Yutaka; and Isobe, Toshinobu, 4,184,176, Cl. 358-184.000.
Ito, Shoji: *See*—
Ueda, Tatehito; Yamanaka, Minoru; and Ito, Shoji, 4,183,372, Cl. 137-81.000.
Ito, Tetsuo: *See*—
Sagawa, Akio; Suzuki, Masayoshi; and Ito, Tetsuo, 4,184,086, Cl. 307-252.00J.
Ito, Yoji: *See*—
Nishikawa, Toshio; Tamura, Sadahiro; Ishikawa, Youhei; and Ito, Yoji, 4,184,130, Cl. 333-206.000.
Ito, Yukio: *See*—
Haga, Toshikatsu; Hori, Saburo; and Ito, Yukio, 4,183,306, Cl. 110-204.000.
ITT Industries, Inc.: *See*—
Bernat, Georg, 4,183,377, Cl. 137-625.170.
Iwao, Shuji; Abe, Tetsuya; Yoshida, Tsutomu; and Wada, Akemi, to Lion Dentifrice Co., Ltd., The. Emulsion-type hair conditioner composition. 4,183,917, Cl. 424-70.000.
Iwasaki Tsushinki Kabushiki Kaisha: *See*—
Saneyoshi, Norio, 4,184,053, Cl. 179-84.00R.
Iwase, Hajime; and Kusuyama, Michio, to Olympus Optical Co., Ltd. Cassette adapter. 4,183,477, Cl. 242-198.000.
Iwata, Shigehisa, to Nippon Electric Co., Ltd. Circuit for digitally processing exposure information. 4,184,151, Cl. 340-347.0AD.
J.A. & A.M. Williams Pty. Ltd.: *See*—
Williams, James A., deceased; and Williams, Colin J., 4,183,294, Cl. 99-537.000.
J. C. Renfroe and Sons, Inc.: *See*—
Renfroe, Charles J., 4,183,571, Cl. 294-101.000.
Jackson, George J., to Caterpillar Tractor Co. Nested bearing crank mechanism. 4,183,267, Cl. 74-804.000.
Jackson, Miles J.: *See*—
Hare, Nicholas S.; and Jackson, Miles J., 4,183,107, Cl. 4-324.000.
Jackson, William. Agitator for storage bin unloaders. 4,183,706, Cl. 414-311.000.
Jacobson, Abraham. Drapery pin packaging and dispensing device. 4,183,447, Cl. 221-232.000.
Jacobson, Abram R., to United States of America, Energy. Interferometer for the measurement of plasma density. 4,183,671, Cl. 356-354.000.
Jacobson, Irving. Remote shutter release mechanism for camera contained in soundproof housing. 4,183,650, Cl. 354-266.000.
Jaeckel, Manfred: *See*—
Eckelt, Michael; Heyden, Rudi; Jaeckel, Manfred; Petzold, Manfred; and Worschech, Kurt, 4,183,875, Cl. 525-6.000.
Jagenberg Werke AG: *See*—
Schonmeier, Herbert, 4,183,474, Cl. 242-66.000.
Jager, Walter. Hydro gas plant with utilization of the residual coke. 4,183,733, Cl. 48-77.000.
Jahan, Christian C.: *See*—
Bouvin, Jacques; and Jahan, Christian C., 4,183,227, Cl. 62-480.000.
Jakob, Helmut: *See*—
Eiselbrecher, Max; Gunther, Rolf; and Jakob, Helmut, 4,183,261, Cl. 74-579.00R.
Jakubowski, Thaddeus, Jr., to McDonnell Douglas Corporation. Automatic sway bracing rack. 4,183,480, Cl. 244-137.00R.
James, Claude: *See*—
Fabre, Jean-Louis; Farge, Daniel; and James, Claude, 4,183,944, Cl. 424-275.000.
James, Henry J.; and Young, Carter R., to Otis Engineering Corporation. Plural parallel tubing with safety joints or release from suspended receptacle. 4,183,404, Cl. 166-133.000.
James, Ronald N., to Terrain King Corporation. Mounting apparatus for offset mower. 4,183,195, Cl. 56-11.900.
Jamshidi, Khosrow. Method of imprinting characters on adhesive bearing tapes. 4,183,300, Cl. 101-426.000.
Jang, Choong-Gook; and Pasarela, Nunzio R., to American Cyanamid Company. Solid compositions of a liquid surfactant and a pyrazolium herbicide. 4,183,740, Cl. 71-92.000.
Janjua, Mohammad B. I.; and LeRoy, Rodney L., to Noranda Mines Limited; and Electrolyser Corporation Ltd., The. Electrolytic method of producing an active cobalt electrode for the evolution of hydrogen. 4,183,790, Cl. 204-48.000.
Jankewitz, Axel: *See*—
Hofmann, Hans J.; and Jankewitz, Axel, 4,183,685, Cl. 401-202.000.
Jansky, John: *See*—
Stofko, John, 4,183,997, Cl. 428-326.000.
Japelj, Miha: *See*—
Hohnjec, Marijan; and Japelj, Miha, 4,183,865, Cl. 260-465.00E.
Jaskolski, Stanley V.; Lade, Robert W.; Schutten, Herman P.; and Spellman, Gordon B., to Eaton Corporation. Temperature sensitive astable multivibrator. 4,184,126, Cl. 331-66.000.
Jatich, Michael. Three dimensional toy. 4,183,167, Cl. 46-16.000.
Jenkins, Thomas E.: *See*—
Crawford, John G.; and Jenkins, Thomas E., 4,183,437, Cl. 211-41.000.
Jenoff, Inc.: *See*—
Peterson, Reuben E., 4,183,721, Cl. 417-40.000.
JGC Corporation: *See*—
Hashimoto, Noboru; Senjo, Teizo; and Kobayashi, Makio, 4,183,902, Cl. 423-210.000.
Jinnai, Isao, to Tokyo Shibaura Denki Kabushiki Kaisha. Enclosed switchboards with insulation test contact member. 4,184,191, Cl. 361-336.000.
Jinnouchi, Takeshi, to Nippon Oil Seal Industry Co., Ltd. Bellows apparatus. 4,183,289, Cl. 92-43.000.
Joachim, Jacky: *See*—
Meunier, Jean-Paul; Joachim, Jacky; and Kafka, Bernard, 4,183,832, Cl. 260-17.300.
Johansson, Carl E., to SKF Industrial Trading and Development Company B.V. Flexible coupling. 4,183,229, Cl. 64-14.000.
Johansson, Karl-Eric. Arrangement for vehicle seats for children. 4,183,580, Cl. 297-250.000.
John Wyeth & Brother Limited: *See*—
Crossley, Roger, 4,183,854, Cl. 260-306.80R.
Ward, Terence J., 4,183,937, Cl. 424-258.000.
Johnson, Carl E.: *See*—
Fischer, Albert K.; and Johnson, Carl E., 4,183,744, Cl. 75-20.00F.
Johnson Controls, Inc.: *See*—
Colla, Jeannine O., 4,183,136, Cl. 29-620.000.
Johnson, Gordon C.: *See*—
Pines, Arthur N.; Johnson, Gordon C.; and Campbell, Fannie L., 4,184,004, Cl. 428-413.000.
Johnson, Matthey & Co., Limited: *See*—
Pearce, Stephen L.; and Selman, Gordon L., 4,183,746, Cl. 75-234.000.
Johnson, Ralph E., to Singer Company, The. Feed and loop taker module for a sewing machine. 4,183,310, Cl. 112-184.000.

Johnston, Linda G.: *See*—
Baigrie, Brian D.; Bailey, Joseph; Johnston, Linda G.; and Mijovic, Miroslav V., 4,183,753, Cl. 430-17.000.
Johren, Paul: *See*—
Morsbach, Martin; and Johren, Paul, 4,183,544, Cl. 277-141.000.
Jones, James E.: *See*—
Marquette, Ralph L.; and Jones, James E., 4,183,379, Cl. 138-158.000.
Joy Manufacturing Company: *See*—
Brennan, John T., 4,183,585, Cl. 299-43.000.
Goland, Yaacov; and Long, Ronald M., 4,183,735, Cl. 55-112.000.
Jozwiak, Joseph E., to Societe Anonyme de Telecommunications. Night guiding device for self-propelled missiles. 4,183,482, Cl. 244-3.160.
Judge, Roderick B.: *See*—
Skov, Ebbe R.; Judge, Roderick B.; and Hemphill, Geoffrey, 4,183,953, Cl. 424-317.000.
Jukes, Alan W.: *See*—
Griffin, Brian P.; Jukes, Alan W.; and Wilkins, Cyril S., 4,183,881, Cl. 264-13.000.
Jumpak Products, Inc.: *See*—
Fima, Raoul G., 4,184,145, Cl. 340-52.00A.
Jung, Michel: *See*—
Metcalf, Brian W.; and Jung, Michel, 4,183,858, Cl. 260-326.14T.
Jung, Paul-Werner: *See*—
Beckers, Hans; Jung, Paul-Werner; Bovians, Herbert; Heyer, Johann M., deceased; Heyer, Hans P., heir; and Wanders, Marlene, heir, 4,183,968, Cl. 426-512.000.
K-B Engineering Co.: *See*—
Kice, John E., 4,183,705, Cl. 414-221.000.
K-Jack Engineering Company, Inc.: *See*—
Chalabian, Jack S., 4,183,426, Cl. 194-67.000.
Kabel-und Metallwerke Gutehoffnungshutte AG: *See*—
Mutzke, Diethelm, 4,183,888, Cl. 264-131.000.
Kabelwerke Brugg AG: *See*—
Benoit, Pierre-Alain; and Widmer, Gilbert, 4,183,616, Cl. 350-96.200.
Kabushiki-Kaisha Fujikoshi: *See*—
Osumi, Sinzi, 4,183,266, Cl. 74-801.000.
Kabushiki Kaisha San Giken: *See*—
Kawaguchi, Yukiyoshi, 4,183,147, Cl. 34-16.000.
Kabushiki Kaisha Sankyo Seiki Seisakusho: *See*—
Yakame, Ken, 4,184,185, Cl. 360-137.000.
Kabushiki Kaisha Seikosha: *See*—
Ikeno, Hitoshi; Sugita, Mitsuyuki; and Yanagi, Hirofumi, 4,183,126, Cl. 29-25.350.
Kabushiki Kaisha Suwa Seikosha: *See*—
Asakawa, Tatsushi, 4,184,124, Cl. 330-264.000.
Maezawa, Shuji; and Okada, Yasushi, 4,183,203, Cl. 58-42.500.
Kada, Takeo: *See*—
Kohno, Masaru; Nakagawa, Yukio; and Kada, Takeo, 4,183,244, Cl. 73-194.00A.
Kafka, Bernard: *See*—
Meunier, Jean-Paul; Joachim, Jacky; and Kafka, Bernard, 4,183,832, Cl. 260-17.300.
Kaiser, Bernhard, to Kienzle Apparate GmbH. Coin operated parking meter. 4,183,205, Cl. 58-142.000.
Kaiser, Emil T. Process for preparing 25-hydroxycholesterol. 4,183,852, Cl. 260-239.55R.
Kajitani, Yukimasa: *See*—
Teshima, Kiyomi; and Kajitani, Yukimasa, 4,183,506, Cl. 266-88.000.
Kalka, Josef; and Winter, Hermann, to Chemische Werke Huls Aktiengesellschaft. Process for the production of high-durometer polymers of vinyl chloride with pH control. 4,184,029, Cl. 526-216.000.
Kamp, Eugene L.: *See*—
Graham, Richard; Kamp, Eugene L.; Bruning, Armin M.; Gritton, Earl S.; and Azdell, L. Ronald, 4,184,059, Cl. 200-302.000.
Kanatani, Keiichi: *See*—
Hinotani, Katsuhiro; Kanatani, Keiichi; Osumi, Masato; and Hayama, Hajime, 4,183,351, Cl. 126-443.000.
Kane, Hugh; and Oellerich, Bruce A., to Clark Control, Inc. Electrical switching apparatus having convertible contact structure. 4,184,134, Cl. 335-198.000.
Kane, John P., to Allied Steel & Conveyors. Static tire inflator. 4,183,392, Cl. 157-1.100.
Kanevsky, Jury L.: *See*—
Rumyantsev, Leonid A.; Esenovsky-Lashkov, Jury K.; Lisevich, Anatoly A.; Kanevsky, Jury L.; Steshenko, Vladimir P.; Guba, Vladimir I.; Abramian, Vladimir A.; Tronin, Jury A.; Fedorov, Petr V.; Nazarov, Boris B.; and Mironenko, Mikhail A., 4,183,424, Cl. 192-3.580.
Kao, Charles K.; and Maklad, Mokhtar S., to International Telephone and Telegraph Corporation. Water resistant high strength fibers. 4,183,621, Cl. 350-96.300.
Karg, Rudolph F., to Copolymer Rubber & Chemical Corporation. Method for producing free flowing particles of elastomeric material. 4,183,887, Cl. 264-130.000.
Karpati, Egon: *See*—
Noteisz, Ferenc; Bartok, Mihaly; Felfoldi, Karoly; Karpati, Egon; and Szporny, Laszlo, 4,184,040, Cl. 546-342.000.
Karrip, Alexander A.; Wisniewski, Joseph M.; and Pergler, Charles C., to Steelcase Inc. Posture iron with safety stop. 4,183,581, Cl. 297-306.000.
Kato, Mitsumi: *See*—
Niimi, Koji; and Kato, Mitsumi, 4,183,275, Cl. 84-1.010.
Katzen, Stanley J.: *See*—
Rekers, Louis J.; Katzen, Stanley J.; and Krekeler, Jerome H., 4,184,028, Cl. 526-105.000.
Katzer, Wayne E.: *See*—
Brock, Waine T.; and Katzer, Wayne E., 4,183,496, Cl. 248-638.000.
Kaufmann, Frank H., to Steel Heddle Manufacturing Company. Lease rods for textile apparatus. 4,183,380, Cl. 139-98.000.
Kawaguchi, Yukiyoshi, to Kabushiki Kaisha San Giken. Dehydration apparatus for fabrics. 4,183,147, Cl. 34-16.000.
Kawano, Yasuhiko: *See*—
Aono, Tetsuya; and Kawano, Yasuhiko, 4,183,859, Cl. 549-72.000.
Kawasoko, Yoshiaki; Chiba, Iwane; Yamazaki, Noboru; Chiyonobu, Toshimi; and Shikuma, Masao, to Nippon Kakan Kabushiki Kaisha. Continuous annealing process for strip coils. 4,183,773, Cl. 148-16.000.
Kay, Francis X. Fluid pressure-operated systems. 4,183,373, Cl. 137-269.500.
Keller, Alfred: *See*—
Gruber, Heinz; and Keller, Alfred, 4,183,234, Cl. 68-205.00R.
Keller, Cecil T.; and von Bose, Robert J., to Oil States Rubber Company. Flange connector. 4,183,189, Cl. 52-637.000.
Keller, Richard A.: *See*—
Green, Robert B.; Keller, Richard A.; Luther, Gabriel G.; Schenk, Peter C.; and Travis, John C., 4,184,127, Cl. 331-94.50S.
Kellermann, Arnold L.; McDonald, David I.; and Grone, Robert J., to Cincinnati Milacron Inc. Method of aligning and coating. 4,183,979, Cl. 427-211.000.
Kelley, Scott A. Water pipe or bong. 4,183,365, Cl. 131-180.000.
Kelsey, G. Stephen; Dey, Arabinda N.; and Bro, Per, to P. R. Mallory & Co. Inc. Polyvalent metal anode containing cells. 4,184,017, Cl. 429-197.000.
Kemmetmueller, Gary H., to Sperry Rand Corporation. RAM error correction using two dimensional parity checking. 4,183,463, Cl. 235-312.000.
Kendall Company, The: *See*—
Marshall, Preston F., 4,183,995, Cl. 428-284.000.
Kennedy, Henry R.: *See*—
Albanese, Damian F.; Kennedy, Henry R.; and Goodwin, Jack W., 4,184,154, Cl. 343-9.00R.
Kennedy, Thomas N.; Lester, William C.; McDonough, George W.; and Michaelsen, John D., to International Business Machines Corporation. Two-sided bias sputter deposition method and apparatus. 4,183,797, Cl. 204-192.00R.
Kent, Arthur P.; and Marks, Mortimer, to Marks Polarized Corporation. Motion picture film for three dimensional projection. 4,183,633, Cl. 352-60.000.
Kerruish, Kermit D., to Morley, Wayne Crieghton. Radio equipped space toy. 4,184,119, Cl. 325-361.000.
Kessler, Stanley. Light diffusing or spectral coating for printed circuit boards and the like. 4,183,767, Cl. 106-236.000.
Key, Edward H., to TRW Inc. Electrical connection apparatus. 4,183,610, Cl. 339-221.00R.
Khutoretsky, Garry M.; Vorontsov, Alexandr I.; and Ignatiev, Anatoly D. Electric machine stator. 4,184,091, Cl. 310-214.000.
Kice, John E., to K-B Engineering Co. Reciprocating airlock valve. 4,183,705, Cl. 414-221.000.
Kidd, Derek J.; and Goodwin, Leslie B., to Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence. Casualty transfer system. 4,183,110, Cl. 5-82.00R.
Kiefer, Edward; and Robertson, Robert B., to Ford Motor Company. Window glass adjusting device. 4,183,178, Cl. 49-375.000.
Kienzle Apparate GmbH: *See*—
Kaiser, Bernhard, 4,183,205, Cl. 58-142.000.
Kies, Walter, to ECKARDT AG. Multiple plug-in connection. 4,183,606, Cl. 339-91.00R.
Kifferstein, Harry P.: *See*—
Kifferstein, Warren M.; and Kifferstein, Harry P., 4,183,524, Cl. 273-29.00A.
Kifferstein, Warren M.; and Kifferstein, Harry P. Practice net. 4,183,524, Cl. 273-29.00A.
Kik, Michael: *See*—
Kunzel, Werner; Schwadtke, Karl; Cioc, Alexander; Kik, Michael; and Puchta, Rolf, 4,183,981, Cl. 427-242.000.
Kikkawa, Ikuo: *See*—
Yoshioka, Mitsuru; Uyeo, Shoichiro; Tsuji, Teruji; Hamashima, Yoshio; Kikkawa, Ikuo; and Nagata, Wataru, 4,183,855, Cl. 260-307.00F.
Kilbourn, Edward E.: *See*—
Weir, W. David; and Kilbourn, Edward E., 4,183,921, Cl. 424-200.000.
Killen, Alston H. Miniature adjustable basketball goal with apertured support bars. 4,183,522, Cl. 273-1.50R.
Kimmel, Hans, to Gunther Papenmeier KG Maschinen-und Apparatebau. Mixer, particularly heating—cooling mixer for chemical processes. 4,183,679, Cl. 366-288.000.
Kimura, Sakae: *See*—
Takanashi, Yukio; Kimura, Sakae; Kuse, Takashi; and Matsuki, Toshiharu, 4,184,100, Cl. 313-337.000.
Kinast, Karlheinz; and Wiegard, Klaus, to Daimler-Benz Aktiengesellschaft. Seal for a regenerative heat-exchanger. 4,183,396, Cl. 165-9.000.
King, Norman E.: *See*—
Eastwood, Michael C.; and King, Norman E., 4,183,893, Cl. 264-288.400.

Kinghorn, George F.: *See*—
Sibley, Alfred E.; Winsor, Travis W.; and Kinghorn, George F., 4,183,354, Cl. 128-711.000.
Kingsley, John T., to Motorola, Inc. Roller scriber apparatus for scribing glass. 4,183,274, Cl. 83-886.000.
Kinoshita, Keijiro, to Nissan Motor Company, Limited. Gas turbine engine control system. 4,183,420, Cl. 180-301.000.
Kinoshita, Masaru: *See*—
Suzuki, Katsuhiro; and Kinoshita, Masaru, 4,184,061, Cl. 219-10.55E.
Kirchweger, Karl; Thien, Gerhard; and Fachbach, Heinz, to List, Hans. Low-noise level internal combustion engines. 4,183,344, Cl. 123-198.00E.
Kirschbaum, Nathan: *See*—
Sclafani, Augustus S.; Kirschbaum, Nathan; and Tauby, William C., 4,183,479, Cl. 244-121.000.
Kisco Company: *See*—
Hoffman, Robert F., 4,183,124, Cl. 29-1.300.
Kisfaludy, Lajos: *See*—
Schon, Istvan; Kisfaludy, Lajos; Varro, Vince; Varga, Laszlo; and Nafradi, Jozsef, 4,183,909, Cl. 424-9.000.
Kitamoto, Tatsuji: *See*—
Yamada, Yasuyuki; and Kitamoto, Tatsuji, 4,183,976, Cl. 427-130.000.
Kitano, Kyozo: *See*—
Sekiguchi, Shizuo; Nagano, Katsumasa; and Kitano, Kyozo, 4,183,867, Cl. 260-513.00T.
Kitazawa, Noboru, to Soky Giken Kogyo Kabushiki Kaisha. Apparatus for supporting a grinding roll. 4,183,181, Cl. 51-75.000.
Kitson, Frederick K.: *See*—
Ervin, Eugene D.; Kitson, Frederick K.; Krasiewich, David M.; and McWhorter, Thomas E., 4,183,384, Cl. 14-19.000.
Kjellberg, Bengt E. S.: *See*—
Bjork, Anders K. K.; Abramo, Aina L.; Hernestam, Sven E. H.; and Kjellberg, Bengt E. S., 4,183,933, Cl. 424-251.000.
Klapwijk, Abraham; and Lettinga, Gatze, to Stamicarbon, B.V. Process for removing organic substances and nitrogen compounds from waste water. 4,183,809, Cl. 210-8.000.
Klauke, Erich: *See*—
Hamprecht, Rainer; Hartmann, Alfons; Klauke, Erich; Hammann, Ingeborg; Roessler, Peter; and Brandes, Wilhelm, 4,183,949, Cl. 424-304.000.
Naumann, Klaus; Behrenz, Wolfgang; Hammann, Ingeborg; Klauke, Erich; and Marhold, Albrecht, 4,183,950, Cl. 424-305.000.
Klebanow, Simon: *See*—
Brown, Jerald E., 4,183,233, Cl. 68-5.00C.
Klein, Howard P., to Texaco Development Corp. Polyurethanes prepared from polyols from 2,3-morpholinediones. 4,184,024, Cl. 521-167.000.
Klein, Robert R.: *See*—
Lundberg, Robert D.; O'Brien, Dennis E.; Makowski, Henry S.; and Klein, Robert R., 4,183,406, Cl. 166-295.000.
Kleinschmager, Herbert: *See*—
Weddigen, Gert; Fischer, Wilfried; Kleinschmager, Herbert; and Haar, Wilhelm, 4,184,013, Cl. 429-104.000.
Klie, Wolfgang; Renner, Hermann; Weidemann, Dieter; and Weisshappel, Helmut, to Daimler-Benz Aktiengesellschaft. Forward longitudinal bearer constructed as closed hollow bearer. 4,183,574, Cl. 296-188.000.
Kliesch, Gunter: *See*—
Bardahl, Nils; and Kliesch, Gunter, 4,184,199, Cl. 363-141.000.
Kliner, George J.: *See*—
Summers, James W.; and Kliner, George J., 4,183,777, Cl. 156-243.000.
Klingelhofer, Hannsgeorg; and Mann, Fridrich, to Bielomatik Leuze & Co., Firma. System for packaging a succession of objects in a foil. 4,183,193, Cl. 53-450.000.
Klockner-Humboldt Deutz Aktiengesellschaft: *See*—
Deussner, Herbert, 4,183,762, Cl. 106-100.000.
Knabe, Herbert; Schlotzhauer, Allan T.; and Scott, Michael A., to Columbia Ribbon & Carbon Mfg. Co., Inc. Stable hectograph compositions, transfer elements and processes. 4,184,003, Cl. 428-411.000.
Knapik, H. Peter G.: *See*—
Adams, Frank H.; and Knapik, H. Peter G., 4,183,827, Cl. 252-439.000.
Knapp, Donald E.; and Sheehan, Gerard M., to American Cyanamid Company. Anatase pigment from ilmenite. 4,183,768, Cl. 106-299.000.
Knappe, LaVerne F.: *See*—
Heiling, Gerald M.; Knappe, LaVerne F.; and Regehr, John L., 4,184,063, Cl. 219-216.000.
Knickerbocker, Ira O.: *See*—
Funk, James E.; and Knickerbocker, Ira O., 4,183,760, Cl. 106-46.000.
Kniepkamp, Alberto H.; and Wangard, William, to Norlin Industries, Inc. Rhythm accent circuit. 4,183,277, Cl. 84-1.030.
Kniese, Wilhelm: *See*—
Tavs, Peter; Kniese, Wilhelm; and Nienburg, Hans, 4,183,871, Cl. 260-604.0HF.
Knopik, Duane L. Exhaust system and process for removing underground contaminant vapors. 4,183,407, Cl. 166-314.000.
Knowles, Miles V., Jr. Wrist support apparatus. 4,183,098, Cl. 2-16.000.
Knowles, Warren D., to Singer Company, The. Snap-on presser foot plate. 4,183,311, Cl. 112-235.000.
Kobayashi, Makio: *See*—
Hashimoto, Noboru; Senjo, Teizo; and Kobayashi, Makio, 4,183,902, Cl. 423-210.000.
Kobayashi, Takashi: *See*—
Shiomura, Tetsunosuke; Ooka, Tatuo; Kobayashi, Takashi; Hagiwara, Kazuo; and Sadotomo, Hideo, 4,184,036, Cl. 528-499.000.
Kobe, Inc.: *See*—
Erickson, John W.; and Brown, Francis B., 4,183,713, Cl. 415-89.000.
Kochetov, Lev A.: *See*—
Petrovsky, Viktor A.; Gassanov, Lev G.; Belyaev, Sergei M.; Kochetov, Lev A.; Kryzhanovsky, Vitaly L.; Palamarchuk, Andrei A.; Timraleev, Rafail J.; Ushakov, Viktor D.; and Parfenjuk, Vitaly M., 4,184,156, Cl. 343-8.000.
Koenig, James J.; and Hsieh, H. Philip, to Aluminum Company of America. Phosphate ester coating on inorganic fillers for polyester resins. 4,183,843, Cl. 260-40.00R.
Koerner, Gotz: *See*—
Theile, Heinz; Hoffmann, Hermann; Rossmy, Gerd; Koerner, Gotz; and Zaske, Peter, 4,183,820, Cl. 252-342.000.
Kohler, Egon, to Bayer Aktiengesellschaft. Preparation of O,O-dialkyl-S-(N-methylcarboxamidomethyl)-thiolphosphoric acid esters. 4,183,880, Cl. 260-970.000.
Kohno, Masaru; Nakagawa, Yukio; and Kada, Takeo, to Fuji Electric Co., Ltd. Ultrasonic flow rate measuring apparatus. 4,183,244, Cl. 73-194.00A.
Koide, Kazuo: *See*—
Tsukamoto, Haruo; Koide, Kazuo; Okazaki, Yuzo; and Yamada, Isao, 4,183,146, Cl. 34-13.800.
Kojima, Takashi: *See*—
Tamai, Tadashi; and Kojima, Takashi, 4,183,414, Cl. 173-118.000.
Kollberg, Sten, to Asea Aktiebolag. Multi-phase stirrer. 4,183,395, Cl. 164-147.000.
Kollmeyer, Willy D., to Shell Oil Company. 3-Benzyl-3-azabicyclo(3.1.0)hexane-2,4-dione. 4,183,857, Cl. 260-326.50B.
Komima, Makoto: *See*—
Yamaguchi, Katsuhiko; Suzuki, Yasuhiro; Komima, Makoto; and Shibata, Hiroshi, 4,183,835, Cl. 260-29.2TN.
Kondo, Shigeo; Yoshiike, Nobuyuki; and Fukai, Masakazu, to Matsushita Electric Industrial Co., Ltd. Electrochromic display device. 4,183,631, Cl. 350-357.000.
Kondo, Toshihiro, to Fuji Photo Film Co., Ltd., a part interest. Focus detecting device. 4,183,641, Cl. 354-25.000.
Kontis, George E., to General Electric Company. Spring buffer. 4,183,510, Cl. 267-70.000.
Kopel, LeRoy, to Advanced Diagnostic Research Corporation. Coupling for a focused ultrasonic transducer. 4,184,094, Cl. 310-335.000.
Koponen, Martti: *See*—
Koski, Erkki; and Koponen, Martti, 4,183,148, Cl. 34-23.000.
Koshiba, Masao: *See*—
Yamamoto, Michihiro; Koshiba, Masao; and Yamamoto, Hisao, 4,183,932, Cl. 424-251.000.
Koski, Erkki; and Koponen, Martti, to Valmet Oy. Paper machine drying section and method of operating the same. 4,183,148, Cl. 34-23.000.
Kosmos International Ltd.: *See*—
McCrae, Ian S., 4,184,202, Cl. 364-413.000.
Kosnoff, Melvin N., to Conviron, Inc. Ultraviolet water purifier. 4,184,076, Cl. 250-437.000.
Kotthaus, Erich, to Werkzeugmaschinenfabrik Oerlikon-Buhrle AG. Method for grinding cutting tools and grinding machines for the performance of the aforesaid method. 4,183,182, Cl. 51-288.000.
Kotthaus, Erich, to Werkzeugmaschinenfabrik Oerlikon-Buhrle AG. Apparatus for manufacturing pairs of spur gears. 4,183,703, Cl. 409-25.000.
Koutsky, L. John, to Sears Manufacturing Company. Roller fore-aft adjustment for a vehicle seat. 4,183,493, Cl. 248-430.000.
Koydl, Ladislav: *See*—
Erben, Edwin; and Koydl, Ladislav, 4,183,320, Cl. 118-725.000.
Kral, Milos: *See*—
Bajer, Frantisek; Nejedly, Josef; and Kral, Milos, 4,183,309, Cl. 112-71.000.
Kramer, Wolfgang: *See*—
Buchel, Karl H.; Kramer, Wolfgang; Plempel, Manfred; and Haller, Ingo, 4,183,940, Cl. 424-273.00R.
Krasiewich, David M.: *See*—
Ervin, Eugene D.; Kitson, Frederick K.; Krasiewich, David M.; and McWhorter, Thomas E., 4,183,384, Cl. 14-19.000.
Kratoska, Thomas J.: *See*—
Gudmestad, Ragnar; and Kratoska, Thomas J., 4,183,383, Cl. 140-105.000.
Kraus, Thaddaus, to Balzers Aktiengesellschaft fur Hochvakuumtechnik und Dunne Schichten. Fluid protective wall cover in a vapor deposition chamber. 4,183,982, Cl. 427-248.00R.
Kreidler Werke GmbH: *See*—
Viessmann, Klaus, 4,183,394, Cl. 164-66.000.
Kreiskott, Horst: *See*—
Binnig, Fritz; Friedrich, Ludwig; Hofmann, Hans P.; Kreiskott, Horst; Mueller, Claus; and Raschack, Manfred, 4,183,935, Cl. 424-256.000.
Krekeler, Jerome H.: *See*—
Rekers, Louis J.; Katzen, Stanley J.; and Krekeler, Jerome H., 4,184,028, Cl. 526-105.000.

Kremer, Charles J.; Condo, Albert C.; and Brown, Donald S., to Atlantic Richfield Company. Coated closed cell foam article. 4,183,996, Cl. 428-315.000.

Kreuser, Marvin J.: *See—*
Olson, Ernest E.; and Kreuser, Marvin J., 4,184,116, Cl. 325-30.000.

Kristiansen, Oddvar, to Svenska Sio Maskin AB. Method and apparatus for detecting ply separations in carcasses. 4,183,240, Cl. 73-15.00R.

Krivakova, Miroslava: *See—*
Lim, Draholsav; Coupek, Jiri; Krivakova, Miroslava; and Pokorny, Svatopluk, 4,184,020, Cl. 521-52.000.

KRKA, farmacevtika, kemija, kozmetika, zdravilisca in gostinstvo, Novo mesto, n.sol.o.: *See—*
Hohnjec, Marijan; and Japelj, Miha, 4,183,865, Cl. 260-465.00E.

Kroeker, Delbert R. Exercising device. 4,183,521, Cl. 272-146.000.

Kroner, Klaus. Foldable container with at least one receptacle for elongated articles. 4,183,433, Cl. 206-257.000.

Kronogard, Sven-Olof. Gas turbine guide apparatus. 4,183,209, Cl. 60-39.16R.

Krupen, Philip, to United States of America, Army. Proximity fuze. 4,183,303, Cl. 102-211.000.

Kryzhanovsky, Vitaly L.: *See—*
Petrovsky, Viktor A.; Gassanov, Lev G.; Belyaev, Sergei M.; Kochetov, Lev A.; Kryzhanovsky, Vitaly L.; Palamarchuk, Andrei A.; Timraleev, Rafail J.; Ushakov, Viktor D.; and Parfenjuk, Vitaly M., 4,184,156, Cl. 343-8.000.

Kubota, Ltd.: *See—*
Miyamoto, Hiroshi; Yamaji, Tadao; Nakajima, Toshi; and Sagara, Takao, 4,183,561, Cl. 285-321.000.

Kubota Tekko Co., Ltd.: *See—*
Hamada, Toshihiko; and Okuda, Shiro, 4,183,287, Cl. 91-384.000.

Kucera, Joseph B., to Lowell, Rudolph L., a part interest. Machine for forming large round bales. 4,183,197, Cl. 56-341.000.

Kucharczyk, Eckhard, to Siegenia-Frank Kg. Air vent. 4,183,290, Cl. 98-37.000.

Kudoh, Kunio: *See—*
Satomi, Toyokazu; Kudoh, Kunio; and Sakurai, Tetsuo, 4,183,653, Cl. 355-3.0SH.

Kuffner, Karl; Lassig, Wolfgang; Meier, Ernst; Ranz, Erwin; and Schranz, Karl-Wilhelm, to Agfa-Gevaert Aktiengesellschaft. Light-sensitive photographic material. 4,183,752, Cl. 430-382.000.

Kufner Textilwerke KG: *See—*
Hefele, Josef, 4,183,978, Cl. 427-202.000.

Kuhbier, Manfred; and Kuhbier, Sigrid, to Ingenieurgesellschaft Kuhbier KG. High security systems for protecting valuable or dangerous consignments from theft. 4,183,708, Cl. 414-543.000.

Kuhbier, Sigrid: *See—*
Kuhbier, Manfred; and Kuhbier, Sigrid, 4,183,708, Cl. 414-543.000.

Kulesza, Ralph J.; Burck, Joseph M.; and Herbstler, Horst-Dieter, to Marvin Glass & Associates. Game with pivoting projector and target compartments. 4,183,533, Cl. 273-101.000.

Kume, Kazunari: *See—*
Nishimura, Katsuo; Wakabayashi, Hisao; Osaka, Takatoshi; Kume, Kazunari; Ogura, Yasuhiro; and Miya, Yukio, 4,183,629, Cl. 350-334.000.

Kumita, Norio; and Narita, Seiichi, to Nippondenso Co., Ltd. Inertia switch assembly. 4,184,057, Cl. 200-61.45R.

Kunzel, Werner; Schwadtke, Karl; Cioc, Alexander; Kik, Michael; and Puchta, Rolf, to Henkel Kommanditgesellschaft auf Aktien. Laundry finishing treatment rope and method. 4,183,981, Cl. 427-242.000.

Kunzer, Heinz: *See—*
von Klinggraff, Gerhard; Bohnes, Karlheinz; Kunzer, Heinz; and Marr, Peter, 4,183,700, Cl. 405-291.000.

Kuraishi, Kaoru, to Toshiba Photo Products Co., Ltd. Electronic flash apparatus. 4,183,647, Cl. 354-132.000.

Kurath, Paul; Tadanier, John S.; and Martin, Jerry R., to Abbott Laboratories. 4-N-Acyl, 2'-N-acyl and 4,2'-N,N'-diacylfortimicin E derivatives. 4,183,920, Cl. 424-180.000.

Kurdziel, George R. Automobile door opening apparatus. 4,183,177, Cl. 49-25.000.

Kureha Kagaku Kogyo Kabushiki Kaisha: *See—*
Haga, Toshikatsu; Hori, Saburo; and Ito, Yukio, 4,183,306, Cl. 110-204.000.

Kurkov, Victor P., to Chevron Research Company. Method for preparing 3-cyanopropanol and 2-pyrrolidone. 4,183,866, Cl. 260-465.600.

Kurosaki Refractories Co., Ltd.: *See—*
Hoshino, Yoshiaki; Hatta, Tokuaki; and Sakai, Masahiro, 4,183,761, Cl. 106-69.000.

Kurt Manufacturing Company, Inc.: *See—*
Lenz, John O., 4,183,387, Cl. 151-41.760.

Kurz, Gunter: *See—*
Besenmatter, Walter; Kurz, Gunter; Metzler, Otto; and Muszumanski, Trude, 4,183,636, Cl. 353-101.000.

Kuse, Takashi: *See—*
Takanashi, Yukio; Kimura, Sakae; Kuse, Takashi; and Matsuki, Toshiharu, 4,184,100, Cl. 313-337.000.

Kusters Corporation: *See—*
Gruber, Heinz; and Keller, Alfred, 4,183,234, Cl. 68-205.00R.

Kusuhara, Yoshinobu: *See—*
Takahashi, Minoru; Ishii, Osamu; Naito, Masanori; Kusuhara, Yoshinobu; and Imahigshi, Naofumi, 4,183,840, Cl. 260-37.00R.

Kusumoto, Koji: *See—*
Sakurai, Yasuo; and Kusumoto, Koji, 4,183,319, Cl. 118-44.000.

Kusuyama, Michio: *See—*
Iwase, Hajime; and Kusuyama, Michio, 4,183,477, Cl. 242-198.000.

Kwant, Pieter B.: *See—*
Breuker, Jacobus H.; de Haan, Hubertus N. H.; and Kwant, Pieter B., 4,183,801, Cl. 208-59.000.

Kyowa Hakko Kogyo Co., Ltd.: *See—*
Nakayama, Kiyoshi; Araki, Kazumi; and Tanaka, Yoshitake, 4,183,786, Cl. 435-116.000.

La Telephonie Industrielle et Commerciale-Telic: *See—*
Meunier, Gerard; and Tisserand, Andre, 4,183,602, Cl. 339-45.00M.

Laboratoire L. Lafon: *See—*
Lafon, Louis, 4,183,951, Cl. 424-315.000.

Lacey, Richard J. Athletic knee protection device. 4,183,099, Cl. 2-24.000.

LaCross, George D., to Continental Group, Inc., The. Tethered tab with changeable bend line. 4,183,445, Cl. 220-273.000.

Lade, Robert W.: *See—*
Jaskolski, Stanley V.; Lade, Robert W.; Schutten, Herman P.; and Spellman, Gordon B., 4,184,126, Cl. 331-66.000.

Laesser, Claude; Viennet, Rene; and Saurer, Eric, to Ebauches S.A. Electronic watch and display device for such watch. 4,183,628, Cl. 350-338.000.

Lafon, Louis, to Laboratoire L. Lafon. Acetohydroxamic acids. 4,183,951, Cl. 424-315.000.

Lammers, Ludwig: *See—*
Walch, Axel; and Lammers, Ludwig, 4,183,811, Cl. 210-23.00R.

Lamy, Jacques E., to Compagnie Generale pour les Developpements Operationnels des Richesses Sous-Marines "C.G. DORIS". Laying of underwater pipelines. 4,183,697, Cl. 405-170.000.

Landfried, Dennis C.; and Busony, Raymond W. Anti-theft door lock. 4,183,569, Cl. 292-347.000.

Langdon, William K.; and Camp, Ronald L., to BASF Wyandotte Corporation. Heteric/block polyoxyalkylene compounds as crude oil demulsifiers. 4,183,821, Cl. 252-331.000.

Langford, Robert H. Audio signal processing system. 4,184,047, Cl. 179-1.00J.

Lanteri, Agostino, to Costruzioni Meccaniche G. Mazzoni S.p.A. Apparatus for admixing liquid and gaseous chemical reactants with uniform pressure in a plurality of reaction tubes. 4,183,897, Cl. 422-197.000.

Larive, David. Conduit making apparatus. 4,183,724, Cl. 425-62.000.

Larkin, William A.; and Ringwood, Robert C., Jr., to M&T Chemicals Inc. Organotin stabilizer composition. 4,183,846, Cl. 260-45.75S.

Laser Precision Corporartion: *See—*
Doyle, Walter M., 4,183,669, Cl. 356-346.000.

Laskowski, Donald R. Apparatus for the three-dimensional reproduction of an object. 4,183,284, Cl. 90-13.300.

Lassig, Wolfgang: *See—*
Kuffner, Karl; Lassig, Wolfgang; Meier, Ernst; Ranz, Erwin; and Schranz, Karl-Wilhelm, 4,183,752, Cl. 430-382.000.

Lauria, Francesco: *See—*
Doria, Gianfederico; Romeo, Ciriaco; Lauria, Francesco; Corno, Maria L.; Giraldi, Piernicola; and Tibolla, Marcello, 4,183,945, Cl. 424-283.000.
Doria, Gianfederico; Romeo, Ciriaco; Lauria, Francesco; Corno, Maria L.; Giraldi, Piernicola; and Tibolla, Marcello, 4,183,946, Cl. 424-283.000.

Lava Crucible Refractories Co.: *See—*
Miller, Eldon D., 4,183,507, Cl. 266-216.000.

Lawrence, Frank S., to Pet Aids Ltd., Inc. Applicator and container assembly for applying liquid compositions to pet animals and the like. 4,183,328, Cl. 119-156.000.

Lawyer, Russell R., to Owens-Corning Fiberglas Corporation. Polyisocyanurate foam comprising reaction product of a polyisocyanate and a polyol mixture comprising a carboxylic ester polyol and a resole polyether polyol using a catalyst comprising dimethylethanolamine and an alkali metal salt of a carboxylic acid. 4,184,022, Cl. 521-118.000.

Lebecque, Maurice G. N. G. Electrical contact system. 4,183,597, Cl. 339-1.00L.

Lecerf, Andre, to Saft-Societe des Accumulateurs Fixes et de Traction. Double chromate composition for use as a positive active material in batteries and battery. 4,184,016, Cl. 429-194.000.

Lectron Products, Inc.: *See—*
Rea, Irvin B.; and Slavin, Michael, 4,183,278, Cl. 84-1.240.

Lee, Arnold St. J., to Milstein Medical Research Foundation, Inc. Variable ratio angular speed converter. 4,183,256, Cl. 74-349.000.

Lee, John M.; and Bauman, William C., to Dow Chemical Company, The. Recovery of Mg^{++} from brines. 4,183,900, Cl. 423-157.000.

Lee, Wen-yaung: *See—*
Eldridge, Jerome M.; Lee, Wen-yaung; and Schwartz, Geraldine C., 4,183,781, Cl. 156-643.000.

Leeds & Northrup Company: *See—*
Connery, James G.; DiNapoli, Louis D.; and Punis, Giancarlo, 4,183,245, Cl. 73-194.00A.

Leiter, Berndt, to Fichtel & Sachs AG. Bicycle with derailleur arrangement. 4,183,255, Cl. 74-217.00B.

Leitzke, Ortwin; Cremer, Josef; and Albrecht, Erhard, to Messer Griesheim GmbH. Process for determining the ozone content of ozone-containing gas mixtures. 4,183,728, Cl. 23-232.00E.

Lely Pacific: *See—*
Sligter, Harm, 4,183,198, Cl. 56-377.000.

Lemaire, Real F. Transparent container for holding a predetermined quantity of coins. 4,183,432, Cl. 206-0.820.

Lembens, Helmut, to Hoechst Aktiengesellschaft. Process for developing a two-component diazotype material on a non-metallic carrier, which material can be developed by the influence of heat. 4,184,060, Cl. 430-151.000.

Lemieux, George W., to National Distillers and Chemical Corporation. Process of producing a nonwoven needled napped fabric having superior resistance to pilling and shedding. 4,183,985, Cl. 428-91.000.
Lenhart, John A.: *See*—
Mey, Robert L.; Cowdrey, Roy M.; and Lenhart, John A., 4,183,594, Cl. 312-27.000.
Lensky, Albert: *See*—
Barrett, Edward E.; Lensky, Albert; Olesen, Paul; Becker, Christian F.; Pinczewski, Morris; Febre, Wilfredo; and Hahn, Steven, 4,183,453, Cl. 227-131.000.
Lenz, John O., to Kurt Manufacturing Company, Inc. T-Bolt adapter. 4,183,387, Cl. 151-41.760.
Leonaggeo, Angelo, Jr. Whirlpool therapy facility and method of treatment. 4,183,329, Cl. 119-158.000.
Leppard, Colin J.; and Leslie, Robert S. E., to CJB Developments Limited. Adsorption heat pump. 4,183,734, Cl. 55-28.000.
LeRoy, Rodney L.: *See*—
Janjua, Mohammad B. I.; and LeRoy, Rodney L., 4,183,790, Cl. 204-48.000.
Leslie, Robert S. E.: *See*—
Leppard, Colin J.; and Leslie, Robert S. E., 4,183,734, Cl. 55-28.000.
Lester, William C.: *See*—
Kennedy, Thomas N.; Lester, William C.; McDonough, George W.; and Michaelsen, John D., 4,183,797, Cl. 204-192.00R.
Lettinga, Gatze: *See*—
Klapwijk, Abraham; and Lettinga, Gatze, 4,183,809, Cl. 210-8.000.
Levasseur, Alain: *See*—
Reau, Jean-Maurice; Levasseur, Alain; Fouassier, Claude; Cales, Bernard; and Hagenmuller, Paul, 4,184,015, Cl. 429-193.000.
Levefelt, Bert G., to Sandvik AB. Roller bit seal excluded from cuttings by air discharge. 4,183,417, Cl. 175-339.000.
Levine, Bernard B. Method for testing to predict and/or diagnose allergy to penicillins, and compounds and compositions for use in such tests. 4,183,910, Cl. 424-9.000.
Levy, Michel: *See*—
Macchi nee Danjon, Odile; Levy, Michel; and Macchi, Cesar, 4,184,129, Cl. 333-18.000.
Lewis, J. Stephen; and Sapkus, Jurgis, to Mattel, Inc. Toy with endless belt for conveying a doll or the like. 4,183,172, Cl. 46-122.000.
Lewis, James P. Ladder hoist. 4,183,423, Cl. 182-103.000.
LH Research: *See*—
Hersom, Wallace N.; and Crum, John E., 4,184,211, Cl. 363-141.000.
Li, Norman N.; and Hucal, Taras, to Exxon Research & Engineering Co. Emulsion preparation method using a packed tube emulsifier. 4,183,681, Cl. 366-336.000.
Li, Norman N.: *See*—
Asher, William J.; Li, Norman N.; and Shrier, Adam L., 4,183,918, Cl. 424-94.000.
Li, Tao P., to Monsanto Company. Catalyst for dehydrocoupling process. 4,183,828, Cl. 252-461.000.
Liberman, Arthur L.: *See*—
Mookherjee, Braja D.; Trenkle, Robert W.; Vock, Manfred H.; Luccarelli, Domenick, Jr.; Schmitt, Frederick L.; Stork, Gilbert; MacDonald, Timothy; and Liberman, Arthur L., 4,183,965, Cl. 426-548.000.
Libertini, Zoltan L., to Avco Corporation. Oil-conducting strut for turbine engines. 4,183,207, Cl. 60-39.080.
Licentia Patent-Verwaltungs-G.m.b.H.: *See*—
Nutz, Karl-Diether, 4,184,087, Cl. 307-360.000.
Lieffers, William C., to Union Oil Company of California. Motionless mixer and method for removing scaled mixing elements therefrom. 4,183,682, Cl. 366-339.000.
Liff, Lawrence J. Liquid base makeup composition. 4,183,898, Cl. 424-63.000.
Liggett Group Inc.: *See*—
Norman, Vello; Moore, Henry; and Williams, Thomas B., 4,183,362, Cl. 131-9.000.
Lim, Draholav; Coupek, Jiri; Krivakova, Miroslava; and Pokorny, Svatopluk, to Ceskoslovenska akademie ved. Preparation of hydrophilic material for gel chromatography. 4,184,020, Cl. 521-52.000.
Lindauer Dornier Gesellschaft mbH: *See*—
Gageur, Fritz, 4,183,451, Cl. 226-91.000.
Lindauer, Jerome I.; Munteanu, Marina; Reich, Sharon; and Pelliza, Enrique, to International Flavors & Fragrances Inc. Composition for slow release of volatile ingredients at high temperature; and article comprising same. 4,184,099, Cl. 313-315.000.
Lindberg, Hans E., to HIAB-FOCO Aktiebolag. Device in loading cranes. 4,183,712, Cl. 414-738.000.
Lindberg, John E., to U.S.A. 161 Developments Ltd. Combustion control system adding a liquid, exhaust gases, and PCV gases. 4,183,338, Cl. 123-119.00A.
Lindblom, Peter, to Applied Research Laboratories S.A. Method of eliminating astigmatism and coma in a spectrograph including a plane grating and two concave, spherical mirrors. 4,183,668, Cl. 356-305.000.
Linder, Lorraine: *See*—
Hovartos, Theodore; and Engel, Walter O., 4,183,470, Cl. 241-46.00B.
Lindner, Herbert G., to United States of America, Army. Communication security method and system. 4,184,117, Cl. 325-33.000.
Lion Dentifrice Co., Ltd., The: *See*—
Iwao, Shuji; Abe, Tetsuya; Yoshida, Tsutomu; and Wada, Akemi, 4,183,917, Cl. 424-70.000.
Lion Fat & Oil Co., The: *See*—
Sekiguchi, Shizuo; Nagano, Katsumasa; and Kitano, Kyozo, 4,183,867, Cl. 260-513.00T.
Lippman, Michael D.: *See*—
Donn, Edward S.; and Lippman, Michael D., 4,183,459, Cl. 235-302.000.
Liquidata, Inc.: *See*—
Feldman, Bernard, 4,183,614, Cl. 350-94.000.
Lisevich, Anatoly A.: *See*—
Rumyantsev, Leonid A.; Esenovsky-Lashkov, Jury K.; Lisevich, Anatoly A.; Kanevsky, Jury L.; Steshenko, Vladimir P.; Guba, Vladimir I.; Abramian, Vladimir A.; Tronin, Jury A.; Fedorov, Petr V.; Nazarov, Boris B.; and Mironenko, Mikhail A., 4,183,424, Cl. 192-3.580.
List, Hans: *See*—
Kirchweger, Karl; Thien, Gerhard; and Fachbach, Heinz, 4,183,344, Cl. 123-198.00E.
Litovits, Theodore Aaron: *See*—
Macedo, Pedro B.; Samanta, Mrinmay; and Simmons, Joseph H., 4,183,620, Cl. 350-96.300.
Little, William C.: *See*—
Applebaum, Melvin; De Pas, Len; and Little, William C., 4,183,162, Cl. 40-530.000.
Loblawscompanies Limited: *See*—
Huczek, Richard, 4,183,438, Cl. 211-49.00D.
Locker, David J., to Eastman Kodak Company. Pre-precipitation spectral sensitizing dye addition process. 4,183,756, Cl. 430-569.000.
Lockwood, George S.: *See*—
Shultz, Fred T.; and Lockwood, George S., 4,183,322, Cl. 119-4.000.
Loewe-Opta GmbH: *See*—
Schaas, Gerhard, 4,184,106, Cl. 315-403.000.
Lohner, Ingolf, to Volkswagenwerk Aktiengesellschaft. Fuel injection system for compression ignition (diesel) internal combustion engines. 4,183,342, Cl. 123-179.00L.
Lomerson, Robert B. Method for metalizing holes in insulation material. 4,183,137, Cl. 29-625.000.
Long, John V.: *See*—
Gagliani, John, 4,183,838, Cl. 260-32.6NT.
Gagliani, John, 4,183,839, Cl. 260-37.00N.
Long, Ronald M.: *See*—
Goland, Yaacov; and Long, Ronald M., 4,183,735, Cl. 55-112.000.
Lord Corporation: *See*—
Schwemmer, Leonard J., 4,183,556, Cl. 285-51.000.
Loubier, Robert J.: *See*—
Dellinger, Eugene L.; and Loubier, Robert J., 4,183,141, Cl. 32-66.000.
Loughley, William A.; and Otterson, Lewis L., to Weatherchem Corporation. Shrink tape closure. 4,183,457, Cl. 229-5.500.
Lovenduski, Timothy J. Safety device for locking the position of a lever arm. 4,183,257, Cl. 74-475.000.
Lowell, Rudolph L.: *See*—
Kucera, Joseph B., 4,183,197, Cl. 56-341.000.
Lower, Donald P., to Eagle-Picher Industries, Inc. Self-aligning bearing. 4,183,590, Cl. 308-72.000.
Lownds, Charles M.; and Healy, Nigel A., to AECI Limited. Explosive containing polyvinyl chloride and aluminum as sensitizer. 4,183,775, Cl. 149-21.000.
Lucas, Arthur B.: *See*—
Copher, Joseph E.; and Lucas, Arthur B., 4,183,489, Cl. 248-278.000.
Lucas Industries Limited: *See*—
Gilbert, Brian, 4,183,340, Cl. 123-148.0DS.
Sheraton, Ronald F.; and Tumber, Brian W., 4,183,467, Cl. 239-73.000.
Lucas, James M.; and Teng, James, to Anheuser-Busch, Incorporated. Gelled lacquer. 4,183,764, Cl. 106-178.000.
Luccarelli, Domenick, Jr.: *See*—
Mookherjee, Braja D.; Trenkle, Robert W.; Vock, Manfred H.; Luccarelli, Domenick, Jr.; Schmitt, Frederick L.; Stork, Gilbert; MacDonald, Timothy; and Liberman, Arthur L., 4,183,965, Cl. 426-548.000.
Lucke Apparate-Bau Gesellschaft Mit Beschrankter Haftung: *See*—
Lucke, Florian, 4,183,194, Cl. 53-571.000.
Lucke, Florian, to Lucke Apparate-Bau Gesellschaft Mit Beschrankter Haftung. Apparatus for producing a wrapper closed by a weld seam for balls of yarn. 4,183,194, Cl. 53-571.000.
Luise, Robert R., to Du Pont de Nemours, E. I., and Company. Process for treating anisotropic melt-forming polymeric products. 4,183,895, Cl. 264-345.000.
Luna, L. Jack. Insulator board for spring probe fixtures. 4,183,609, Cl. 339 R-176.000.
Lundberg, Robert D.; O'Brien, Dennis E.; Makowski, Henry S.; and Klein, Robert R., to Exxon Production Research Company. Method of treating a borehole using gellable polymers. 4,183,406, Cl. 166-295.000.
Lunn, Anthony C.: *See*—
Goebel, James C.; and Lunn, Anthony C., 4,183,367, Cl. 132-7.000.
Luther, Gabriel G.: *See*—
Green, Robert B.; Keller, Richard A.; Luther, Gabriel G.; Schenk, Peter C.; and Travis, John C., 4,184,127, Cl. 331-94.50S.
Lynch, Richard W.; and Dotson, Ronald L., to Olin Corporation. Method for preparing calcium hypochlorite. 4,183,907, Cl. 423-474.000.
Lynes, Inc.: *See*—
Coone, Malcolm G., 4,183,698, Cl. 405-227.000.

Lytle, Rex L. Toy wheel runway. 4,183,170, Cl. 46-114.000.

M&T Chemicals Inc.: *See—*
Chessin, Hyman; and Seyb, Edgar J., Jr., 4,183,789, Cl. 204-43.00T.
Larkin, William A.; and Ringwood, Robert C., Jr., 4,183,846, Cl. 260-45.75S.

Maas, William M.: *See—*
Packard, Charles E.; Maas, William M.; and Seims, Robert J., 4,183,472, Cl. 241-200.000.

Macchi, Cesar: *See—*
Macchi nee Danjon, Odile; Levy, Michel; and Macchi, Cesar, 4,184,129, Cl. 333-18.000.

Macchi nee Danjon, Odile; Levy, Michel; and Macchi, Cesar, to Agence Nationale de Valorisation de la Recherche (ANVAR). Systems for transmitting data between distant locations. 4,184,129, Cl. 333-18.000.

MacDonald, Timothy: *See—*
Mookherjee, Braja D.; Trenkle, Robert W.; Vock, Manfred H.; Luccarelli, Domenick, Jr.; Schmitt, Frederick L.; Stork, Gilbert; MacDonald, Timothy; and Liberman, Arthur L., 4,183,965, Cl. 426-548.000.

MacDonald, Walter F., Jr. Buggy carrier. 4,183,452, Cl. 224-273.000.

Macedo, Pedro B.; Samanta, Mrinmay; and Simmons, Joseph H., to De Macedo, Pedro Buarque; and Litovits, Theodore Aaron. Joint doped porous glass article with high modifier concentrations. 4,183,620, Cl. 350-96.300.

Maestri, Frederick A. Guard barrier system. 4,183,505, Cl. 256-13.100.

Maezawa, Shuji; and Okada, Yasushi, to Kabushiki Kaisha Suwa Seikosha. Electronic timepiece time zone display. 4,183,203, Cl. 58-42.500.

Magee, Bervin W. Self-watering apparatus for growing plants. 4,183,175, Cl. 47-79.000.

Maggioni, Paolo, to Brichima S.p.A. Process for preparing aromatic methylene-dioxy compounds. 4,183,861, Cl. 260-340.50R.

Magnaflux Corporation: *See—*
Auge, Charles W., 4,184,097, Cl. 313-55.000.

Magnavox Company, The: *See—*
Skelton, Merle D., 4,184,105, Cl. 315-397.000.

Magnie, Robert L. Enhanced recoveries of petroleum and hydrogen from underground reservoirs. 4,183,405, Cl. 166-260.000.

Magnuson, Victor E. Instrument and tool honing mechanism. 4,183,180, Cl. 51-58.000.

Maillet, Edgard J., to Agence Nationale de Valorisation de la Recherche (ANVAR). Double acting precision deep-stamping press. 4,183,238, Cl. 72-349.000.

Maines, Ben. Pet dryer. 4,183,323, Cl. 119-19.000.

Makishima, Tokuo: *See—*
Ueno, Hiroshi; Sezaki, Eiji; Inaba, Naomi; Makishima, Tokuo; Watanabe, Koh; and Wada, Shozo, 4,183,826, Cl. 252-429.00B.

Makisumi, Yasuo; Sasatani, Takashi; and Murabayashi, Akira, to Shionogi & Co., Ltd. Process for the production of urea derivatives. 4,183,856, Cl. 548-246.000.

Maklad, Mokhtar S.: *See—*
Kao, Charles K.; and Maklad, Mokhtar S., 4,183,621, Cl. 350-96.300.

Makowski, Henry S.: *See—*
Lundberg, Robert D.; O'Brien, Dennis E.; Makowski, Henry S.; and Klein, Robert R., 4,183,406, Cl. 166-295.000.

Makuch, John A., to Bunker Ramo Corporation. Connector pin assembly and method for terminating an optical fiber. 4,183,619, Cl. 350-96.210.

Malecki, Ronald J.; and O'Neil, Charles P., to Amerace Corporation. Fluid pulse counter. 4,183,374, Cl. 137-624.200.

Malgarin, Albert. Solar beacon. 4,183,622, Cl. 350-99.000.

Manfroni, Ezio, to Carpigiani Bruto Macchine Automatiche S.P.A. Scraper and mixer element for ice cream making machines. 4,183,680, Cl. 366-312.000.

Mann, Fridrich: *See—*
Klingelhofer, Hannsgeorg; and Mann, Fridrich, 4,183,193, Cl. 53-450.000.

Mansfield, Gerald R.: *See—*
Beaty, Robert C.; and Mansfield, Gerald R., 4,183,973, Cl. 427-2.000.

Manville Manufacturing Corporation: *See—*
Flynn, Eugene R., 4,183,501, Cl. 251-357.000.

Marazzi, Pietro. Quick baking process for ceramic products. 4,183,885, Cl. 264-58.000.

Marcal Paper Mills, Inc.: *See—*
Smaw, Jesse B., 4,183,192, Cl. 53-444.000.

Marchioro, Ignazio, to Escher Wyss Ltd. Controlled deflection roll. 4,183,128, Cl. 29-116.0AD.

Marek, Richard G. Work holder for adjustably supporting a workpiece. 4,183,511, Cl. 269-17.000.

Marhold, Albrecht: *See—*
Naumann, Klaus; Behrenz, Wolfgang; Hammann, Ingeborg; Klauke, Erich; and Marhold, Albrecht, 4,183,950, Cl. 424-305.000.

Marien, Pieter: *See—*
Irik, Gijsbert W.; Marien, Pieter; and Fierst van Wijnandsbergen, Marius F., 4,184,058, Cl. 200-153.00P.

Marikawa, Hiroshi: *See—*
Ono, Seibei; Shibuya, Kouichi; and Marikawa, Hiroshi, 4,183,842, Cl. 260-40.00P.

Marion Health & Safety, Inc.: *See—*
Avery, Carl F., Jr., 4,183,684, Cl. 401-133.000.

Marks, Mortimer: *See—*
Kent, Arthur P.; and Marks, Mortimer, 4,183,633, Cl. 352-60.000.

Marks Polarized Corporation: *See—*
Kent, Arthur P.; and Marks, Mortimer, 4,183,633, Cl. 352-60.000.

Marmon Company: *See—*
Bione, Angelo A.; and Sauvey, Donald R., 4,183,276, Cl. 84-1.030.

Marquette, Ralph L.; and Jones, James E., to Mutz Corp. Duct board assembly. 4,183,379, Cl. 138-158.000.

Marr, Peter: *See—*
von Klinggraff, Gerhard; Bohnes, Karlheinz; Kunzer, Heinz; and Marr, Peter, 4,183,700, Cl. 405-291.000.

Marshall, Preston F., to Kendall Company, The. Octa-directional nonwoven fabric. 4,183,995, Cl. 428-284.000.

Martija, Henry M., to Bell & Howell Company. Apparatus for mounting a hollow cylindrical member. 4,183,475, Cl. 242-68.300.

Martin, Charles F. Methods and joints for connecting tubular members. 4,183,555, Cl. 285-39.000.

Martin, Jerry R.: *See—*
Kurath, Paul; Tadanier, John S.; and Martin, Jerry R., 4,183,920, Cl. 424-180.000.

Martin, Merrill D. Rotary web shearing machine. 4,183,271, Cl. 83-156.000.

Martner, Glen R.: *See—*
Allen, Richard T.; Moyer, Rudolph H.; Sibbett, Donald J.; Anderson, Howard H.; Martner, Glen R.; and Willis, Don, 4,183,247, Cl. 73-421.50R.

Marulic, Walter J.: *See—*
Gutridge, Jack E.; Miller, Roy W.; and Marulic, Walter J., 4,183,179, Cl. 49-411.000.

Maruoka, Hiroyuki, to Nissan Motor Company, Limited. Air-fuel mixture ratio control using electrostatic force. 4,183,337, Cl. 123-119.00E.

Marvin Glass & Associates: *See—*
Kulesza, Ralph J.; Burck, Joseph M.; and Herbstler, Horst-Dieter, 4,183,533, Cl. 273-101.000.
Terzian, Rouben T., 4,183,171, Cl. 46-119.000.

Marzouk, El-Sayed M.: *See—*
Taiani, Patrick M.; and Marzouk, El-Sayed M., 4,184,090, Cl. 310-104.000.

Maschinenfabrik Alfred Schmermund GmbH & Co.: *See—*
Bald, Hubert, 4,183,429, Cl. 198-572.000.

Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft: *See—*
Erben, Edwin; and Koydl, Ladislav, 4,183,320, Cl. 118-725.000.

Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft (MAN): *See—*
Bozung, Hanns-Gunther, 4,183,719, Cl. 416-183.000.

Maslen, Frank P.: *See—*
Roesler, Frank C.; Hines, David A.; Maslen, Frank P.; and Fawcett, Richard, 4,183,787, Cl. 435-43.000.

Mason, Gary E.: *See—*
Fisher, George A.; and Mason, Gary E., 4,183,551, Cl. 280-785.000.

Massachusetts Institute of Technology: *See—*
Haus, Hermann A., 4,184,131, Cl. 333-195.000.
Raffel, Jack I.; and Bernacki, Stephen E., 4,184,172, Cl. 357-50.000.

Massey, William A., to Molins Machine Company, Inc. Ratiometric edge detector system. 4,184,080, Cl. 250-548.000.

Mathews, Lyle H. Modular conduit spacer rack. 4,183,484, Cl. 248-49.000.

Matsuki, Toshiharu: *See—*
Takanashi, Yukio; Kimura, Sakae; Kuse, Takashi; and Matsuki, Toshiharu, 4,184,100, Cl. 313-337.000.

Matsumoto, Nobuo; Tsuji, Osami; and Hamada, Shinji, to Fuji Photo Film Co., Ltd. Stripping and developing process and device therefor. 4,183,751, Cl. 430-258.000.

Matsumura, Kazuhiro: *See—*
Shiga, Akinobu; Fukui, Yoshiharu; Matsumura, Kazuhiro; Sasaki, Toshio; and Okawa, Masahisa, 4,183,824, Cl. 252-429.00B.

Matsunaga, Douglas S.: *See—*
Greinke, James G.; Matsunaga, Douglas S.; and Mosquera, Eric W., 4,183,273, Cl. 83-479.000.

Matsuo, Takehiko: *See—*
Murai, Keiichi; and Matsuo, Takehiko, 4,183,748, Cl. 430-135.000.

Matsushita Electric Industrial Co., Ltd.: *See—*
Arao, Yuzuru; Nishio, Katsufumi; Mikami, Masashi; and Murasawa, Toyoaki, 4,183,293, Cl. 99-512.000.
Kondo, Shigeo; Yoshiike, Nobuyuki; and Fukai, Masakazu, 4,183,631, Cl. 350-357.000.
Minakuchi, Hiroshi, 4,184,114, Cl. 324-161.000.
Yoshida, Akihiko; and Nishino, Atsushi, 4,184,192, Cl. 361-433.000.

Matsuura, Masataka: *See—*
Funada, Fumiaki; Toda, Kiyoshi; Matsuura, Masataka; and Wada, Tomio, 4,183,630, Cl. 350-334.000.

Mattel, Inc.: *See—*
Lewis, J. Stephen; and Sapkus, Jurgis, 4,183,172, Cl. 46-122.000.

Matthias, Jan: *See—*
Porsche, Ferdinand A.; and Matthias, Jan, 4,183,206, Cl. 58-152.00C.

Mauller, Christian, to Regie Nationale des Usines Renault. Position servo loop for robot or automatic machine. 4,184,109, Cl. 318-622.000.

Maurischat, Gunther: *See—*
Waschk, Fritz; Webersik, Heinz; Maurischat, Gunther; and Schott, Walter, 4,183,654, Cl. 355-3.0FU.

Mautz, Karlheinz; Weiland, Emil; and Schwarz, Alois, to Messerschmitt-Bolkow-Blohm GmbH. Rotor for a rotary wing aircraft. 4,183,718, Cl. 416-134.00A.

Maxam Switchgear Limited: *See—*
Nicholls, Wilfrid, 4,183,608, Cl. 339-147.00R.

May & Baker Limited: *See*—
Caton, Michael P. L.; Coffee, Edward C. J.; and Watkins, Gordon L., 4,183,870, Cl. 260-590.00C.
May, William A.; Fernandez, Ivan R.; Donohue, Patrick P.; and DiCara, Alphonse J., to Fritzche Dodge & Olcott Inc. Preparation of a flavor extender from whey. 4,183,970, Cl. 426-583.000.
Mayer, Donald K., to Thermo King Corporation. Recirculating bearing oil filter assembly. 4,183,591, Cl. 308-187.000.
Mayer, Peter: *See*—
Cappel, Bert; Mayer, Peter; Wirz, Burkhardt; and Decker, Peter, 4,183,298, Cl. 101-348.000.
Mazey, David J.: *See*—
Hudson, John A.; Mazey, David J.; and Nelson, Richard S., 4,184,079, Cl. 250-492.00B.
McBride, Lyle E., Jr., to Texas Instruments Incorporated. Connector apparatus. 4,184,070, Cl. 250-227.000.
McCabe, Francis J., to Prefco Products, Inc. Method of forming a smoke, fire and air control damper with stamped blade hinge. 4,183,129, Cl. 29-157.00R.
McCrae, Ian S., to Kosmos International Ltd. Biorhythm computer. 4,184,202, Cl. 364-413.000.
McDonald, David I.: *See*—
Kellermann, Arnold L.; McDonald, David I.; and Grone, Robert J., 4,183,979, Cl. 427-211.000.
McDonnell Douglas Corporation: *See*—
Jakubowski, Thaddeus, Jr., 4,183,480, Cl. 244-137.00R.
McDonough, George W.: *See*—
Kennedy, Thomas N.; Lester, William C.; McDonough, George W.; and Michaelsen, John D., 4,183,797, Cl. 204-192.00R.
McElroy, David J., to Texas Instruments Incorporated. High density floating gate electrically programmable ROM. 4,184,207, Cl. 365-185.000.
McGee, Theodore L., to American Can Company. Melt extrudable polypropylene-polystyrene composition and method. 4,183,845, Cl. 260-42.460.
McGill, Robert W.; and Winiasz, Michael E., to A-T-O Inc. Mounting bar and gripper jaw assembly. 4,183,428, Cl. 198-479.000.
McGraw-Edison Company: *See*—
Gaia, Aldino J.; and Urani, Angelo, 4,184,137, Cl. 337-161.000.
McKay, Dennis E.: *See*—
Engelhardt, Bernard; and McKay, Dennis E., 4,183,436, Cl. 206-622.000.
McKay, Dwight L., to Phillips Petroleum Company. Passivating metals on cracking catalysts. 4,183,803, Cl. 208-120.000.
McKenna, Charles M.; and Willcox, H. Keith, to International Business Machines Corporation. Photon enhanced reactive ion etching. 4,183,780, Cl. 156-643.000.
McLaughlin, Robert L.: *See*—
Wood, Donald C.; and McLaughlin, Robert L., 4,183,959, Cl. 424-358.000.
McWhorter, Thomas E.: *See*—
Ervin, Eugene D.; Kitson, Frederick K.; Krasiewich, David M.; and McWhorter, Thomas E., 4,183,384, Cl. 14-19.000.
Meckler, Milton. Eye medication dispensing frames. 4,183,355, Cl. 128-233.000.
Medtronic GmbH: *See*—
Wieser, Alfred, 4,184,092, Cl. 310-316.000.
Meier, Ernst: *See*—
Kuffner, Karl; Lassig, Wolfgang; Meier, Ernst; Ranz, Erwin; and Schranz, Karl-Wilhelm, 4,183,752, Cl. 430-382.000.
Meiller, Hermann, to Willibald Grammer. Vehicle seat. 4,183,492, Cl. 248-395.000.
Melander, Clarence, to East Wind Industries, Inc. Replaceable visor. 4,183,101, Cl. 2-424.000.
Melberg, Robert A.; and Wagner, Richard J., to Sperry Rand Corporation. Integrating processor element. 4,184,201, Cl. 364-200.000.
Melberg, Robert A.: *See*—
Wagner, Richard J.; and Melberg, Robert A., 4,184,200, Cl. 364-200.000.
Melchior, Michael T.; Milliman, George E.; and Sartori, Guido, to Exxon Research & Engineering Co. Method of removing carbon dioxide from gases utilizing an alkaline absorption solution containing a cyclic urea anti-foaming agent. 4,183,903, Cl. 423-226.000.
Mellian, Sirvart A., to United States of America, Army. Body armor for women. 4,183,097, Cl. 2-2.500.
Menezes, Mark A.: *See*—
Yuen, Raymond C.; Menezes, Mark A.; and Stopper, Herbert, 4,183,460, Cl. 235-302.000.
Menioux, Claude C. F., to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation. Propulsion system for supersonic aircraft. 4,183,211, Cl. 60-224.000.
Merck & Co., Inc.: *See*—
Miller, Neil W., 4,183,356, Cl. 128-264.000.
Merrell Toraude et Compagnie: *See*—
Metcalf, Brian W.; and Jung, Michel, 4,183,858, Cl. 260-326.14T.
Mesnel, Francois, to Etablissements Mesnel. Method of making sealing strip joint. 4,183,778, Cl. 156-245.000.
Messer Griesheim GmbH: *See*—
Leitzke, Ortwin; Cremer, Josef; and Albrecht, Erhard, 4,183,728, Cl. 23-232.00E.
Messerschmitt-Bolkow-Blohm GmbH: *See*—
Albrecht, Helmut; Bschorr, Oskar; and Hassel, Helmut, 4,183,572, Cl. 295-7.000.
Eiselbrecher, Max; Gunther, Rolf; and Jakob, Helmut, 4,183,261, Cl. 74-579.00R.
Mautz, Karlheinz; Weiland, Emil; and Schwarz, Alois, 4,183,718, Cl. 416-134.00A.
Metal Box Limited: *See*—
Eastwood, Michael C.; and King, Norman E., 4,183,893, Cl. 264-288.400.
Metcalf, Brian W.; and Jung, Michel, to Merrell Toraude et Compagnie. α-Vinyl tryptophanes. 4,183,858, Cl. 260-326.14T.
Meteyer, Thomas E.; and Fries, William, to Rohm and Haas Company. Oxidatively stable ion exchange resin condensation product of an epichlorohydrin and a polyamine. 4,184,019, Cl. 521-34.000.
Metzeler Schaum GmbH: *See*—
Brendel, Hugo, 4,183,889, Cl. 264-134.000.
Metzler, Otto: *See*—
Besenmatter, Walter; Kurz, Gunter; Metzler, Otto; and Muszumanski, Trude, 4,183,636, Cl. 353-101.000.
Meunier, Gerard; and Tisserand, Andre, to La Telephonie Industrielle et Commerciale-Telic. Front panel for circuit boards. 4,183,602, Cl. 339-45.00M.
Meunier, Jean-Paul; Joachim, Jacky; and Kafka, Bernard, to Saint-Gobain Industries. Aqueous solutions of etherified melamine-formaldehyde resins with long shelf life and low free formaldehyde content. 4,183,832, Cl. 260-17.300.
Mey, Robert L.; Cowdrey, Roy M.; and Lenhart, John A., to Singer Company, The. Two level sewing system. 4,183,594, Cl. 312-27.000.
Meyer, Erwin: *See*—
Brockmuller, Friedrich-Franz; Feldkamper, Richard; and Meyer, Erwin, 4,183,518, Cl. 271-182.000.
Meyer, Oscar A., to Monsanto Company. Recovery of boron from waste streams. 4,183,904, Cl. 423-283.000.
Meyer, Ralph L.; and Sobel, Alan, to Zenith Radio Corporation. Method of making an insulator-support for luminescent display panels and the like. 4,183,125, Cl. 29-25.150.
Meyers, George L., to American Can Company. Tray having hinged, recloseable lid with locking feature. 4,183,458, Cl. 229-44.00R.
Meyn, Pieter. Apparatus for splitting, cleaning and skinning poultry gizzards. 4,183,117, Cl. 17-11.000.
Michaels, Edwin B. Antimicrobial compositions. 4,183,952, Cl. 424-316.000.
Michaelsen, John D.: *See*—
Kennedy, Thomas N.; Lester, William C.; McDonough, George W.; and Michaelsen, John D., 4,183,797, Cl. 204-192.00R.
Michelet, Jacques; and Zanetta, Hugues, to Institut de Recherches de la Siderurgie Francaise. Metallurgical induction heating apparatus. 4,183,508, Cl. 266-242.000.
Mickle, James B., deceased (by Mickle, Lois T., widow and legally appointed agent of the executor); Smith, Wanda J.; and Dieken, Laurel M., to Oklahoma Agricultural & Mechanical Colleges acting for and on behalf of Oklahoma State University of Agriculture and Applied Science, The Board of Regents of the. Method of manufacturing a high protein snack food. 4,183,966, Cl. 426-42.000.
Mickle, Lois T., widow and legally appointed agent of the executor: *See*—
Mickle, James B., deceased; Smith, Wanda J.; and Dieken, Laurel M., 4,183,966, Cl. 426-42.000.
Middlebrook, Robert D.: *See*—
Cuk, Slobodan M.; and Middlebrook, Robert D., 4,184,197, Cl. 363-16.000.
Mijatovic, Ljubivoje, to Grundig E. M. V. Elektro-Mechanische Versuchsanstalt Max Grundig. Method and device for tracking video signals on a magnetic tape by detecting phase jumps. 4,184,181, Cl. 360-77.000.
Mijovic, Miroslav V.: *See*—
Baigrie, Brian D.; Bailey, Joseph; Johnston, Linda G.; and Mijovic, Miroslav V., 4,183,753, Cl. 430-17.000.
Mikami, Masashi: *See*—
Arao, Yuzuru; Nishio, Katsufumi; Mikami, Masashi; and Murasawa, Toyoaki, 4,183,293, Cl. 99-512.000.
Milde, Helmut I., to High Voltage Engineering Corporation. Electrostatic precipitation. 4,183,736, Cl. 55-139.000.
Miller, Eldon D., to Lava Crucible Refractories Co. System for introducing addition agents into vessel of molten metal. 4,183,507, Cl. 266-216.000.
Miller, Neil W., to Merck & Co., Inc. Ophthalmic applicator device. 4,183,356, Cl. 128-264.000.
Miller, Roy W.: *See*—
Gutridge, Jack E.; Miller, Roy W.; and Marulic, Walter J., 4,183,179, Cl. 49-411.000.
Milliken Research Corporation: *See*—
Brown, Robert S.; and Fay, Robert C., 4,183,112, Cl. 15-50.00R.
Reynolds, James R., 4,183,318, Cl. 118-34.000.
Milliman, George E.: *See*—
Melchior, Michael T.; Milliman, George E.; and Sartori, Guido, 4,183,903, Cl. 423-226.000.
Mills, Loring K., to Polaroid Corporation. Photographic system, apparatus and cassette for processing a self-developing film unit. 4,183,651, Cl. 354-304.000.
Millward, John D., to Rank Organisation Limited, The. Television apparatus for consecutive frame scanning of continuous motion film. 4,184,177, Cl. 358-214.000.
Milnes, Frank J.: *See*—
Gavin, David F.; Milnes, Frank J.; and Parziale, John R., 4,183,816, Cl. 252-47.500.
Milpat Corporation: *See*—
Spitz, Albert W.; and Schwab, Milton I., 4,183,307, Cl. 110-235.000.
Milstein Medical Research Foundation, Inc.: *See*—
Lee, Arnold St. J., 4,183,256, Cl. 74-349.000.

Minakuchi, Hiroshi, to Matsushita Electric Industrial Co., Ltd. Arrangement for indicating revolutional speed of a revolving body. 4,184,114, Cl. 324-161.000.

Minami, Satoyuki: *See*—
Yabe, Kenji; Soda, Atsuhiko; Minami, Satoyuki; and Iida, Osamu, 4,183,749, Cl. 430-211.000.

Minami, Shunsuke: *See*—
Tahara, Yasuteru; Minami, Shunsuke; Oda, Masaharu; and Sera, Mikio, 4,183,666, Cl. 356-73.100.

Mineral Deposits Limited: *See*—
Giffard, Philip J., 4,183,806, Cl. 209-459.000.

Minnesota Mining and Manufacturing Company: *See*—
Hedin, Roland C.; and Whitaker, Lawrence R., Jr., 4,184,184, Cl. 360-133.000.
Snell, John B., 4,183,454, Cl. 228-50.000.

Minolta Camera Kabushiki Kaisha: *See*—
Imura, Toshinori; and Yamanaka, Akira, 4,183,643, Cl. 354-25.000.
Ishihara, Toshiaki; Atsumi, Fumitoshi; and Yamada, Tetsuya, 4,183,656, Cl. 355-8.000.

Minowa, Seigi; Tanaka, Toshiro; and Yasuda, Nozomi, to Asahi Denka Kogyo K.K. Hard butter. 4,183,971, Cl. 426-607.000.

Mironenko, Mikhail A.: *See*—
Rumyantsev, Leonid A.; Esenovsky-Lashkov, Jury K.; Lisevich, Anatoly A.; Kanevsky, Jury L.; Steshenko, Vladimir P.; Guba, Vladimir I.; Abramian, Vladimir A.; Tronin, Jury A.; Fedorov, Petr V.; Nazarov, Boris B.; and Mironenko, Mikhail A., 4,183,424, Cl. 192-3.580.

Mitchell, Albert W.; and Woods, Donald M., to Weed Eater, Inc. Apparatus for cutting vegetation. 4,183,138, Cl. 30-276.000.

Mitchell, David S.; and Sageman, David R., to Chevron Research Company. Indirect heat retorting process with cocurrent and countercurrent flow of hydrocarbon-containing solids. 4,183,800, Cl. 208-8.00R.

Mitsubishi Rayon Company, Limited: *See*—
Tahara, Yasuteru; Minami, Shunsuke; Oda, Masaharu; and Sera, Mikio, 4,183,666, Cl. 356-73.100.

Mitsui Engineering & Shipbuilding Co., Ltd.: *See*—
Teshima, Kiyomi; and Kajitani, Yukimasa, 4,183,506, Cl. 266-88.000.

Mitsui Toatsu Chemicals, Incorporated: *See*—
Shiomura, Tetsunosuke; Ooka, Tatuo; Kobayashi, Takashi; Hagiwara, Kazuo; and Sadotomo, Hideo, 4,184,036, Cl. 528-499.000.

Mitsutomi, Katsuyoshi: *See*—
Yoshizawa, Kiyoshi; Nojiro, Kikuo; Mitsutomi, Katsuyoshi; Hashimoto, Hiroshi; Noguchi, Akira; and Tanno, Kazuo, 4,183,807, Cl. 210-2.000.

Miya, Yukio: *See*—
Nishimura, Katsuo; Wakabayashi, Hisao; Osaka, Takatoshi; Kume, Kazunari; Ogura, Yasuhiro; and Miya, Yukio, 4,183,629, Cl. 350-334.000.

Miyaguchi, Akinori; and Chino, Yasuyoshi, to Nippon Zeon Co. Ltd.; and Morimura-Chemetron Ltd. Novel modified resins, process for preparing the same, and a composition for printing ink containing said modified resins as vehicle components. 4,183,833, Cl. 260-23.70C.

Miyamoto, Hiroshi; Yamaji, Tadao; Nakajima, Toshi; and Sagara, Takao, to Kubota, Ltd. Separation-prevented pipe joint which can be assembled from inside pipe. 4,183,561, Cl. 285-321.000.

Miyao, Takayuki, to Aisin Seiki Kabushiki Kaisha. Static pressure thrust bearing. 4,183,288, Cl. 91-488.000.

Miyazuka, Hajime: *See*—
Sato, Masamichi; and Miyazuka, Hajime, 4,183,818, Cl. 430-115.000.

Mobil Oil Corporation: *See*—
Okorodudu, Abraham 0., 4,183,817, Cl. 252-49.900.
Winn, B. Meredith, Jr., 4,183,905, Cl. 423-300.000.

Moen, Alfred M., to Stanadyne, Inc. Collapsible sleeve mixing valve. 4,183,376, Cl. 137-625.170.

Moery, Richard B.; and Roberson, Wayne J., to Farm Equipment Company, Inc. Apparatus for coupling a rotatable control device to a stationary switch. 4,183,690, Cl. 403-59.000.

Molins Machine Company, Inc.: *See*—
Massey, William A., 4,184,080, Cl. 250-548.000.

Mollenauer, Linn F.: *See*—
Bloom, David M.; and Mollenauer, Linn F., 4,183,795, Cl. 204-157.10R.

Molliex, Michel, to Ardex S.A. Recovery device for parts for automatic lathes or analogous devices. 4,183,269, Cl. 82-2.500.

Monarch Marking Systems, Inc.: *See*—
Dobras, Bruce W., 4,183,465, Cl. 235-494.000.

Monath, Robert; and Stamm, Russell D., to General Instrument Corporation. Low profile pushbutton tuner. 4,183,250, Cl. 74-10.330.

Monogram Industries, Inc.: *See*—
Rod, Robert L., 4,184,164, Cl. 343-744.000.

Monsanto Company: *See*—
Bollinger, Wayne A., 4,183,890, Cl. 264-139.000.
Coran, Aubert Y.; and Patel, Raman, 4,183,876, Cl. 525-232.000.
Danos, James C.; and Heider, Robert J., 4,183,283, Cl. 90-11.00C.
Gupta, Kedar P.; and Thousand, J. W., Jr., 4,184,135, Cl. 336-62.000.
Hopkins, Byrd, 4,184,027, Cl. 526-60.000.
Li, Tao P., 4,183,828, Cl. 252-461.000.
Meyer, Oscar A., 4,183,904, Cl. 423-283.000.

Monster Molding, Ltd.: *See*—
Blair, Edgar A., 4,183,883, Cl. 264-40.100.

Montanarini, Marco, to Contraves AG. Arresting device for an antenna part of a space vehicle. 4,183,490, Cl. 248-291.000.

Monterey Abalone Farms: *See*—
Shultz, Fred T.; and Lockwood, George S., 4,183,322, Cl. 119-4.000.

Mookherjee, Braja D.; Trenkle, Robert W.; Vock, Manfred H.; Luccarelli, Domenick, Jr.; Schmitt, Frederick L.; Stork, Gilbert; MacDonald, Timothy; and Liberman, Arthur L., to International Flavors & Fragrances Inc. 2- and 3-Cyclotetradecen-1-ones as bitterness depressants. 4,183,965, Cl. 426-548.000.

Moore, Henry: *See*—
Norman, Vello; Moore, Henry; and Williams, Thomas B., 4,183,362, Cl. 131-9.000.

Moore, Stanley R., to Freeze Sleeves of America, Inc. Refrigerated beverage holder. 4,183,226, Cl. 62-457.000.

Moracz, Donald J.: *See*—
Spiegelberg, William D.; and Moracz, Donald J., 4,183,236, Cl. 72-42.000.

Morales, John J., to S.R.C. Laboratories, Inc. Cone type dynode for photomultiplier tube. 4,184,098, Cl. 313-95.000.

Moret, Michel A.; and Woog, Philippe G. E. Diagnostic lamp, particularly for checking teeth. 4,184,196, Cl. 433-29.000.

Mori, Chuzo, to Carl Manufacturing Co., Ltd. Index device. 4,183,161, Cl. 40-389.000.

Morihashi, Toshihumi, to Murata Kikai Kabushiki Kaisha. Method and apparatus for producing spun yarn. 4,183,202, Cl. 57-328.000.

Morimura-Chemetron Ltd.: *See*—
Miyaguchi, Akinori; and Chino, Yasuyoshi, 4,183,833, Cl. 260-23.70C.

Morley, Wayne Crieghton: *See*—
Kerruish, Kermit D., 4,184,119, Cl. 325-361.000.

Morrow, Dennis W., to Eagle Industries, Inc. Pick up truck and wrecker assembly. 4,183,709, Cl. 414-563.000.

Morrow, Robert S., to IRD Mechanalysis, Inc. Data acquisition system. 4,184,205, Cl. 364-508.000.

Morsbach, Martin; and Johren, Paul, to Goetzewerke, Friedrich Goetze AG. Multi-part piston oil ring. 4,183,544, Cl. 277-141.000.

Moser, Paul: *See*—
Haferkamp, Dirk; Hodzic, Alija; Moser, Paul; and Prasch, Dieter, 4,183,784, Cl. 176-60.000.

Mosquera, Eric W.: *See*—
Greinke, James G.; Matsunaga, Douglas S.; and Mosquera, Eric W., 4,183,273, Cl. 83-479.000.

Motor Wheel Corporation: *See*—
Snyder, Robert C., 4,183,588, Cl. 303-110.000.

Motorola, Inc.: *See*—
Cannalte, Gary A.; and Ramsland, David G., 4,184,118, Cl. 325-183.000.
Davis, Earl K.; Hansen, Kent W.; Taylor, Scot W.; and Wentworth, Robert M., 4,184,189, Cl. 361-283.000.
Kingsley, John T., 4,183,274, Cl. 83-886.000.
Parker, Norman W., 4,184,046, Cl. 179-1.0GS.
Welling, John R., 4,183,135, Cl. 29-588.000.

Moyer, Rudolph H.: *See*—
Allen, Richard T.; Moyer, Rudolph H.; Sibbett, Donald J.; Anderson, Howard H.; Martner, Glen R.; and Willis, Don, 4,183,247, Cl. 73-421.50R.

Mueller, Claus: *See*—
Binnig, Fritz; Friedrich, Ludwig; Hofmann, Hans P.; Kreiskott, Horst; Mueller, Claus; and Raschack, Manfred, 4,183,935, Cl. 424-256.000.

Mukai, Sadayoshi; Otani, Yoshiaki; and Yamaguchi, Osamu. Electrical capacitor. 4,184,190, Cl. 361-315.000.

Mukawa, Tojiro, to Nippon Electric Co., Ltd. Circuit for converting from analog signal into digital signal and vice versa by using insulated gate field effect transistors. 4,184,152, Cl. 340-347.00C.

Mullally, James F., to United States of America, Air Force. Analog tuning voltage circuit with analog signal multiplexing. 4,184,125, Cl. 330-282.000.

Mullane, William I., Jr., to Procter & Gamble Company, The. Method of and apparatus for optically detecting anomalous subsurface structure in translucent articles. 4,184,175, Cl. 358-93.000.

Muller, Helmut: *See*—
Engels, Kaspar; and Muller, Helmut, 4,183,676, Cl. 366-172.000.

Muller, Johann: *See*—
Wagner, Paul-Heinz; Hirtsiefer, Karl-Richard; and Muller, Johann, 4,183,260, Cl. 74-575.000.

Munakata, Daisaburo; and Yoshida, Motomasa, to Clarion Company Limited. Mobile citizen band transceiver control unit with an audio frequency apparatus. 4,184,115, Cl. 325-25.000.

Munteanu, Marina: *See*—
Lindauer, Jerome I.; Munteanu, Marina; Reich, Sharon; and Pelliza, Enrique, 4,184,099, Cl. 313-315.000.

Murabayashi, Akira: *See*—
Makisumi, Yasuo; Sasatani, Takashi; and Murabayashi, Akira, 4,183,856, Cl. 548-246.000.

Murai, Keiichi; and Matsuo, Takehiko, to Canon Kabushiki Kaisha. Method of removing surface ionic impurities on inorganic photoconductive material. 4,183,748, Cl. 430-135.000.

Muraki, Shigeru: *See*—
Toyoda, Takaaki; and Muraki, Shigeru, 4,183,831, Cl. 252-522.00R.

Murasawa, Toyoaki: *See*—
Arao, Yuzuru; Nishio, Katsufumi; Mikami, Masashi; and Murasawa, Toyoaki, 4,183,293, Cl. 99-512.000.

Murata Kikai Kabushiki Kaisha: *See*—
Morihashi, Toshihumi, 4,183,202, Cl. 57-328.000.

Murata Manufacturing Co., Ltd.: *See*—
Nishikawa, Toshio; Tamura, Sadahiro; Ishikawa, Youhei; and Ito, Yoji, 4,184,130, Cl. 333-206.000.
Murphy, David W.: *See*—
Reese, Paul B.; and Murphy, David W., 4,183,217, Cl. 60-632.000.
Murphy, John H.: *See*—
Sterrett, Charles C.; and Murphy, John H., 4,184,089, Cl. 310-52.000.
Murphy, William F. Toy. 4,183,169, Cl. 46-100.000.
Murray, Harold J.: *See*—
Simpson, Anthony; Peterkin, Stuart M.; Brooksby, Brian T.; and Murray, Harold J., 4,183,534, Cl. 273-105.100.
Muszumanski, Trude: *See*—
Besenmatter, Walter; Kurz, Gunter; Metzler, Otto; and Muszumanski, Trude, 4,183,636, Cl. 353-101.000.
Muth, Myron C.: *See*—
Schilling, William F.; Beltran, Adrian M.; and Muth, Myron C., 4,183,456, Cl. 228-175.000.
Mutz Corp.: *See*—
Marquette, Ralph L.; and Jones, James E., 4,183,379, Cl. 138-158.000.
Mutzke, Diethelm, to Kabel-und Metallwerke Gutehoffnungshutte AG. Method of coating wire. 4,183,888, Cl. 264-131.000.
Nadella, & French Body Corporate: *See*—
Stephan, Gerard, 4,183,258, Cl. 74-492.000.
Nafradi, Jozsef: *See*—
Schon, Istvan; Kisfaludy, Lajos; Varro, Vince; Varga, Laszlo; and Nafradi, Jozsef, 4,183,909, Cl. 424-9.000.
Nagaishi, Hatuo; and Suzuki, Suzuo, to Nissan Motor Company, Limited. Electrostatic fuel atomizing apparatus for internal combustion engine. 4,183,339, Cl. 123-119.00E.
Naganawa, Masahiro, to Imasen Electric Co., Ltd. Electrically operated wheeled chair for physically handicapped persons. 4,183,578, Cl. 297-90.000.
Nagano, Katsumasa: *See*—
Sekiguchi, Shizuo; Nagano, Katsumasa; and Kitano, Kyozo, 4,183,867, Cl. 260-513.00T.
Nagashima, Eiji; and Fukushima, Masanori, to Tokico Ltd. Elastic ring fitting device. 4,183,132, Cl. 29-451.000.
Nagashima, Kanji, to Nichiden Machinery, Limited. Heating apparatus having ellipsoidal reflecting mirror. 4,184,065, Cl. 219-349.000.
Nagata, Wataru: *See*—
Hamashima, Yoshio; Narisada, Masayuki; Hayashi, Sadao; and Nagata, Wataru, 4,183,928, Cl. 424-248.520.
Yoshioka, Mitsuru; Uyeo, Shoichiro; Tsuji, Teruji; Hamashima, Yoshio; Kikkawa, Ikuo; and Nagata, Wataru, 4,183,855, Cl. 260-307.00F.
Nagatani, Kuniaki: *See*—
Nishiyama, Ryuzo; Fujikawa, Kanichi; Haga, Takahiro; and Nagatani, Kuniaki, 4,184,041, Cl. 546-345.000.
Nagel, David J.; and Peckerar, Martin C., to United States of America, Navy. Pulsed X-ray lithography. 4,184,078, Cl. 250-492.00A.
Naito, Masanori: *See*—
Takahashi, Minoru; Ishii, Osamu; Naito, Masanori; Kusuhara, Yoshinobu; and Imahigshi, Naofumi, 4,183,840, Cl. 260-37.00R.
Nakagawa, Yukio: *See*—
Kohno, Masaru; Nakagawa, Yukio; and Kada, Takeo, 4,183,244, Cl. 73-194.00A.
Nakajima, Toshi: *See*—
Miyamoto, Hiroshi; Yamaji, Tadao; Nakajima, Toshi; and Sagara, Takao, 4,183,561, Cl. 285-321.000.
Nakatsuka, Hisayoshi, to Namiki Precision Jewel Co., Ltd. Lateral pressure detector for use with a phonograph record player. 4,183,537, Cl. 274-1.00R.
Nakayama, Kiyoshi; Araki, Kazumi; and Tanaka, Yoshitake, to Kyowa Hakko Kogyo Co., Ltd. Process for production of L-serine. 4,183,786, Cl. 435-116.000.
Namiki Precision Jewel Co., Ltd.: *See*—
Nakatsuka, Hisayoshi, 4,183,537, Cl. 274-1.00R.
Nara Grinding Machinery Works, Ltd.: *See*—
Sudo, Sadayuki; and Sudo, Takenaga, 4,183,674, Cl. 366-91.000.
Narco Scientific, Inc.: *See*—
Smith, Frank P., 2nd, 4,184,157, Cl. 343-108.00R.
Smith, Frank P., 2nd, 4,184,158, Cl. 343-108.00R.
Narisada, Masayuki: *See*—
Hamashima, Yoshio; Narisada, Masayuki; Hayashi, Sadao; and Nagata, Wataru, 4,183,928, Cl. 424-248.520.
Narita, Seiichi: *See*—
Kumita, Norio; and Narita, Seiichi, 4,184,057, Cl. 200-61.45R.
Narumi China Corporation: *See*—
Suzuki, Katsuhiro; and Kinoshita, Masaru, 4,184,061, Cl. 219-10.55E.
Nash, David D., to Durapipe Limited. Moulding of synthetic plastics products. 4,183,448, Cl. 222-63.000.
Nash, Robert B. Electric clothes dryer heater. 4,183,150, Cl. 34-86.000.
National Distillers and Chemical Corporation: *See*—
Lemieux, George W., 4,183,985, Cl. 428-91.000.
National Petro Chemicals Corporation: *See*—
Rekers, Louis J.; Katzen, Stanley J.; and Krekeler, Jerome H., 4,184,028, Cl. 526-105.000.
National Research Development Corporation: *See*—
Heenan, Kenneth, 4,183,589, Cl. 308-1.00A.
Hinshaw, Waldo S., 4,184,110, Cl. 324-0.50R.
Hudson, John A.; Mazey, David J.; and Nelson, Richard S., 4,184,079, Cl. 250-492.00B.
National Starch and Chemical Corporation: *See*—
Rubens, Roger W., 4,183,969, Cl. 426-578.000.
National Tax Administration Agency: *See*—
Yoshizawa, Kiyoshi; Nojiro, Kikuo; Mitsutomi, Katsuyoshi; Hashimoto, Hiroshi; Noguchi, Akira; and Tanno, Kazuo, 4,183,807, Cl. 210-2.000.
Naumann, Klaus; Behrenz, Wolfgang; Hammann, Ingeborg; Klauke, Erich; and Marhold, Albrecht, to Bayer Aktiengesellschaft. Combating arthropods with 2,2-dimethyl-3-vinyl-cyclopropane carboxylic acid esters of halogenated benzyl alcohols. 4,183,950, Cl. 424-305.000.
Naundorf, Peter: *See*—
Oppenlander, Harry; and Naundorf, Peter, 4,183,701, Cl. 405-295.000.
Nazarov, Boris B.: *See*—
Rumyantsev, Leonid A.; Esenovsky-Lashkov, Jury K.; Lisevich, Anatoly A.; Kanevsky, Jury L.; Steshenko, Vladimir P.; Guba, Vladimir I.; Abramian, Vladimir A.; Tronin, Jury A.; Fedorov, Petr V.; Nazarov, Boris B.; and Mironenko, Mikhail A., 4,183,424, Cl. 192-3.580.
Nejedly, Josef: *See*—
Bajer, Frantisek; Nejedly, Josef; and Kral, Milos, 4,183,309, Cl. 112-71.000.
Nelson, Richard S.: *See*—
Hudson, John A.; Mazey, David J.; and Nelson, Richard S., 4,184,079, Cl. 250-492.00B.
Nelson, William B.; and Barnes, Gordon J., to Gunson's Sortex Limited. Process for splitting pistachio nuts. 4,183,967, Cl. 426-460.000.
Nelsson, Nels: *See*—
Eby, Lawrence T.; and Nelsson, Nels, 4,183,987, Cl. 428-192.000.
Neuweiler, Armin; and Rickenbach, Jakob, to Fritz Gegauf Aktiengesellschaft. Mechanism for coupling a drive to a shaft. 4,183,473, Cl. 242-20.000.
Newswanger, Paul S. Air heating and circulating fireplace grate. 4,183,347, Cl. 126-121.000.
Neynaber Chemie GmbH: *See*—
Eckelt, Michael; Heyden, Rudi; Jaeckel, Manfred; Petzold, Manfred; and Worschech, Kurt, 4,183,875, Cl. 525-6.000.
Nichiden Machinery, Limited: *See*—
Nagashima, Kanji, 4,184,065, Cl. 219-349.000.
Nicholls, Wilfrid, to Maxam Switchgear Limited. Electrical distribution systems. 4,183,608, Cl. 339-147.00R.
Nicholson, Terence P. Plate type heat exchangers. 4,183,403, Cl. 165-166.000.
Nielsen, Richard B., to Grefco, Inc. Perlite filler coated with polydimethylsiloxane. 4,183,980, Cl. 427-215.000.
Nienburg, Hans: *See*—
Tavs, Peter; Kniese, Wilhelm; and Nienburg, Hans, 4,183,871, Cl. 260-604.0HF.
Nightingale, Douglas D. J., to Imperial Chemical Industries Limited. Control valves. 4,183,500, Cl. 251-335.00R.
Nihon Beru-Haueru Kabushiki Kaisha: *See*—
Abe, Masao, 4,183,640, Cl. 354-25.000.
Niimi, Koji; and Kato, Mitsumi, to Nippon Gakki Seizo Kabushiki Kaisha. Electronic musical instrument. 4,183,275, Cl. 84-1.010.
Nilssen, Ole K. High efficiency push-pull inverters. 4,184,128, Cl. 331-113.00A.
Nippon Electric Co., Ltd.: *See*—
Iwata, Shigehisa, 4,184,151, Cl. 340-347.0AD.
Mukawa, Tojiro, 4,184,152, Cl. 340-347.00C.
Takahashi, Sakari, 4,184,085, Cl. 307-238.000.
Nippon Electric Glass Company, Limited: *See*—
Suzuki, Katsuhiro; and Kinoshita, Masaru, 4,184,061, Cl. 219-10.55E.
Nippon Gakki Seizo Kabushiki Kaisha: *See*—
Niimi, Koji; and Kato, Mitsumi, 4,183,275, Cl. 84-1.010.
Nippon Kakan Kabushiki Kaisha: *See*—
Kawasoko, Yoshiaki; Chiba, Iwane; Yamazaki, Noboru; Chiyonobu, Toshimi; and Shikuma, Masao, 4,183,773, Cl. 148-16.000.
Nippon Kogaku K. K.: *See*—
Tsunashima, Teruyoshi, 4,183,625, Cl. 350-207.000.
Nippon Lissajou Co., Ltd.: *See*—
Arai, Hiroshi, 4,184,102, Cl. 315-47.000.
Nippon Oil Seal Industry Co., Ltd.: *See*—
Jinnouchi, Takeshi, 4,183,289, Cl. 92-43.000.
Nippon Soken, Inc.: *See*—
Tanaka, Eizi; Ohashi, Michihiro; and Nishimatsu, Akira, 4,183,216, Cl. 60-611.000.
Nippon Steel Corporation: *See*—
Teshima, Kiyomi; and Kajitani, Yukimasa, 4,183,506, Cl. 266-88.000.
Nippon Zeon Co. Ltd.: *See*—
Miyaguchi, Akinori; and Chino, Yasuyoshi, 4,183,833, Cl. 260-23.70C.
Nippondenso Co., Ltd.: *See*—
Kumita, Norio; and Narita, Seiichi, 4,184,057, Cl. 200-61.45R.
Yagi, Yoshikazu, 4,183,230, Cl. 64-25.000.
Nishikawa, Masao; and Yamamoto, Hitoshi, to Honda Giken Kogyo Kabushiki Kaisha. Shock absorber for vehicle use. 4,183,509, Cl. 267-8.00R.
Nishikawa, Toshio; Tamura, Sadahiro; Ishikawa, Youhei; and Ito, Yoji, to Murata Manufacturing Co., Ltd. Filter devices incorporating dielectric resonators and leakage cable. 4,184,130, Cl. 333-206.000.
Nishimatsu, Akira: *See*—
Tanaka, Eizi; Ohashi, Michihiro; and Nishimatsu, Akira, 4,183,216, Cl. 60-611.000.

Nishimura, Katsuo; Wakabayashi, Hisao; Osaka, Takatoshi; Kume, Kazunari; Ogura, Yasuhiro; and Miya, Yukio, to Citizen Watch Co. Ltd. Electronic optical display device and method of manufacturing the same. 4,183,629, Cl. 350-334.000.

Nishino, Atsushi: *See—*
Yoshida, Akihiko; and Nishino, Atsushi, 4,184,192, Cl. 361-433.000.

Nishio, Katsufumi: *See—*
Arao, Yuzuru; Nishio, Katsufumi; Mikami, Masashi; and Murasawa, Toyoaki, 4,183,293, Cl. 99-512.000.

Nishiyama, Ryuzo; Fujikawa, Kanichi; Haga, Takahiro; and Nagatani, Kuniaki, to Ishihara Sangyo Kaisha Ltd. 2-Substituted-5-trifluoromethylpyridine compounds. 4,184,041, Cl. 546-345.000.

Nishizawa, Masahiro: *See—*
Ueyama, Takehiko; Nishizawa, Masahiro; Yamazaki, Eiichi; and Ogura, Iwao, 4,183,637, Cl. 354-1.000.

Nissan Motor Company, Limited: *See—*
Aoyama, Syunichi, 4,183,333, Cl. 123-119.00A.
Asano, Masaharu; and Hosaka, Akio, 4,183,335, Cl. 123-119.0EC.
Gotoh, Miyuki, 4,183,381, Cl. 139-370.100.
Hideshima, Keiji; Sasaki, Naoki; and Takaki, Masaoki, 4,183,462, Cl. 235-304.000.
Kinoshita, Keijiro, 4,183,420, Cl. 180-301.000.
Maruoka, Hircyuki, 4,183,337, Cl. 123-119.00E.
Nagaishi, Hatuo; and Suzuki, Suzuo, 4,183,339, Cl. 123-119.00E.
Takagi, Yasuo, 4,183,212, Cl. 60-274.000.
Takeuchi, Tohru, 4,184,083, Cl. 290-40.00C.

Nitto Electric Industrial Co., Ltd.: *See—*
Yamaguchi, Katsuhiko; Suzuki, Yasuhiro; Komima, Makoto; and Shibata, Hiroshi, 4,183,835, Cl. 260-29.2TN.

Nobbe, Paul J. Concrete slotted floor including wooden insert. 4,183,324, Cl. 119-20.000.

Noguchi, Akira: *See—*
Yoshizawa, Kiyoshi; Nojiro, Kikuo; Mitsutomi, Katsuyoshi; Hashimoto, Hiroshi; Noguchi, Akira; and Tanno, Kazuo, 4,183,807, Cl. 210-2.000.

Noguchi, Hiroshi: *See—*
Uchida, Toshio; Yabuta, Yorimiti; Noguchi, Hiroshi; Hasegawa, Eiichi; and Ikeda, Teppei, 4,183,990, Cl. 428-212.000.

Nojiro, Kikuo: *See—*
Yoshizawa, Kiyoshi; Nojiro, Kikuo; Mitsutomi, Katsuyoshi; Hashimoto, Hiroshi; Noguchi, Akira; and Tanno, Kazuo, 4,183,807, Cl. 210-2.000.

Noranda Mines Limited: *See—*
Janjua, Mohammad B. I.; and LeRoy, Rodney L., 4,183,790, Cl. 204-48.000.

Nordisk Insulinlaboratorium: *See—*
Hansen, Bruno A.; and Andresen, Finn H., 4,183,849, Cl. 260-112.700.

Nordsiek, Karl-Heinz: *See—*
Streck, Roland; Zerpner, Dieter; Haag, Horst; and Nordsiek, Karl-Heinz, 4,183,844, Cl. 260-42.150.

Norlin Industries, Inc.: *See—*
Kniepkamp, Alberto H.; and Wangard, William, 4,183,277, Cl. 84-1.030.

Norman, Juanita, to Ecotroleum, Inc. Fuel-air control device. 4,183,336, Cl. 123-119.00B.

Norman, Vello; Moore, Henry; and Williams, Thomas B., to Liggett Group Inc. Decreasing the burn rate of smoking tobaccos. 4,183,362, Cl. 131-9.000.

Norris Industries, Inc.: *See—*
Allemann, James G., 4,183,565, Cl. 292-163.000.

Norris, Jerry L.; and Hartmann, Clinton S., to Texas Instruments Incorporated. AM/FM time division surface wave device transmitter. 4,184,052, Cl. 179-15.00A.

Northern Telecom Limited: *See—*
Barber, Robert J.; and Campbell, Francis R., 4,183,601, Cl. 339-44.00R.

Nose, Hiroyuki: *See—*
Takahara, Kitao; Nose, Hiroyuki; Sasaki, Makoto; and Sakata, Kimio, 4,183,716, Cl. 416-96.00A.

Noteisz, Ferenc; Bartok, Mihaly; Felfoldi, Karoly; Karpati, Egon; and Szporny, Laszlo, to Richter Gedeon Vegyeszeti Gyar Rt. Hydroxymethyl-pyridine esters and a process for the preparation thereof. 4,184,040, Cl. 546-342.000.

Nova Research Foundation Corporation: *See—*
Taiani, Patrick M.; and Marzouk, El-Sayed M., 4,184,090, Cl. 310-104.000.

Nugent, Steven F.: *See—*
Nutting, Donald W.; and Nugent, Steven F., 4,183,632, Cl. 352-17.000.

Nuovo Pignone S.p.A.: *See—*
Bergamini, Giorgio, 4,184,081, Cl. 250-556.000.

Nusslein, Ludwig; and Arndt, Friedrich, to Schering AG. 2-(Dimethylcarbamoylimino)-benzthiazoline-3-carboxylic acid esters, and herbicidal compositions containing same. 4,183,739, Cl. 71-90.000.

Nutting, Donald W.; and Nugent, Steven F., to Comput-A-Sound Corporation. Electronic system for synchronizing motion picture and sound recordings. 4,183,632, Cl. 352-17.000.

Nutz, Karl-Diether, to Licentia Patent-Verwaltungs-G.m.b.H. Window discriminator or voltage range sensor. 4,184,087, Cl. 307-360.000.

O'Brien, Dennis E.: *See—*
Lundberg, Robert D.; O'Brien, Dennis E.; Makowski, Henry S.; and Klein, Robert R., 4,183,406, Cl. 166-295.000.

Oce-van der Grinten N.V.: *See—*
Winthaegen, Leon M. W., 4,183,658, Cl. 355-3.0BE.

Oda, Masaharu: *See—*
Tahara, Yasuteru; Minami, Shunsuke; Oda, Masaharu; and Sera, Mikio, 4,183,666, Cl. 356-73.100.

Odermann, Charles R.; and Herron, William L., to Singer Company, The. Sewing machine cassette threading system. 4,183,313, Cl. 112-302.000.

Oehler, Harry G.; Herman, David S.; and Cricchi, James R., to Westinghouse Electric Corp. High yield processing for silicon-on-sapphire CMOS integrated circuits. 4,183,134, Cl. 29-571.000.

Oellerich, Bruce A.: *See—*
Kane, Hugh; and Oellerich, Bruce A., 4,184,134, Cl. 335-198.000.

Off, Joseph W. A.; and Early, Judson H., to Haggar Company. System for spreading flexible material. 4,183,514, Cl. 270-31.000.

Ogawa, Iwakichi, to Takara Co., Ltd. Toy assembly with interchangeable parts and detachable appendages. 4,183,173, Cl. 46-202.000.

Ogura, Iwao: *See—*
Ueyama, Takehiko; Nishizawa, Masahiro; Yamazaki, Eiichi; and Ogura, Iwao, 4,183,637, Cl. 354-1.000.

Ogura, Yasuhiro: *See—*
Nishimura, Katsuo; Wakabayashi, Hisao; Osaka, Takatoshi; Kume, Kazunari; Ogura, Yasuhiro; and Miya, Yukio, 4,183,629, Cl. 350-334.000.

Ohashi, Michihiro: *See—*
Tanaka, Eizi; Ohashi, Michihiro; and Nishimatsu, Akira, 4,183,216, Cl. 60-611.000.

Ohkura, Zenichi, to Asahi Kogaku Kogyo Kabushiki Kaisha. Enlarger lens system having stop-value scale illuminating mechanism. 4,183,661, Cl. 355-61.000.

Ohmura, Hiroshi; and Shirane, Hideto, to Fuji Photo Film Co., Ltd. Data printing device for photographic camera. 4,183,645, Cl. 354-106.000.

Ohno, Ietatsu. Agitating mixing apparatus. 4,183,678, Cl. 366-224.000.

Ohrle, Rolf; and Godel, Richard, to Daimler-Benz Aktiengesellschaft. Sliding roof for vehicles. 4,183,577, Cl. 296-137.00E.

Oil-Dri Corporation of America: *See—*
Omilinsky, Barry A.; and Wolatz, Fredrick E., 4,183,763, Cl. 106-109.000.

Oil States Rubber Company: *See—*
Keller, Cecil T.; and von Bose, Robert J., 4,183,189, Cl. 52-637.000.

Oji Paper Co., Ltd.: *See—*
Tsukamoto, Haruo; Koide, Kazuo; Okazaki, Yuzo; and Yamada, Isao, 4,183,146, Cl. 34-13.800.

Okada, Yasushi: *See—*
Maezawa, Shuji; and Okada, Yasushi, 4,183,203, Cl. 58-42.500.

Okawa, Masahisa: *See—*
Shiga, Akinobu; Fukui, Yoshiharu; Matsumura, Kazuhiro; Sasaki, Toshio; and Okawa, Masahisa, 4,183,824, Cl. 252-429.00B.

Okazaki, Yuzo: *See—*
Tsukamoto, Haruo; Koide, Kazuo; Okazaki, Yuzo; and Yamada, Isao, 4,183,146, Cl. 34-13.800.

Oklahoma Agricultural & Mechanical Colleges acting for and on behalf of Oklahoma State University of Agriculture and Applied Science, The Board of Regents of the: *See—*
Mickle, James B., deceased; Smith, Wanda J.; and Dieken, Laurel M., 4,183,966, Cl. 426-42.000.

Okorodudu, Abraham O., to Mobil Oil Corporation. Load-carrying additives and compositions thereof. 4,183,817, Cl. 252-49.900.

Okuda, Shiro: *See—*
Hamada, Toshihiko; and Okuda, Shiro, 4,183,287, Cl. 91-384.000.

Olander, Walter K., to General Electric Company. Manganese benzoinimine catalysts and process of preparing polyphenylene ethers using said compounds as catalysts. 4,184,034, Cl. 528-215.000.

Olesen, Paul: *See—*
Barrett, Edward E.; Lensky, Albert; Olesen, Paul; Becker, Christian F.; Pinczewski, Morris; Febre, Wilfredo; and Hahn, Steven, 4,183,453, Cl. 227-131.000.

Olin Corporation: *See—*
Gavin, David F.; Milnes, Frank J.; and Parziale, John R., 4,183,816, Cl. 252-47.500.
Lynch, Richard W.; and Dotson, Ronald L., 4,183,907, Cl. 423-474.000.

Olsen, Edward C. Horse-feeding apparatus. 4,183,327, Cl. 119-51.110.

Olson, Ernest E.; and Kreuser, Marvin J., to Argos Products Company, Inc. Communication system having analog-to-digital-to-analog conversion means. 4,184,116, Cl. 325-30.000.

Olson, Herbert H., to Aeroquip Corporation. Locomotive performance recorder. 4,184,166, Cl. 346-49.000.

Olympus Optical Co., Ltd.: *See—*
Fukuoka, Kenji, 4,183,642, Cl. 354-25.000.
Iwase, Hajime; and Kusuyama, Michio, 4,183,477, Cl. 242-198.000.
Tsunefuji, Katsuhiko, 4,183,646, Cl. 354-106.000.

Omilinsky, Barry A.; and Wolatz, Fredrick E., to Oil-Dri Corporation of America. Gypsum-based granules and method of production. 4,183,763, Cl. 106-109.000.

Omori, Masao: *See—*
Seya, Seiichi; Omori, Masao; and Sakamoto, Masahide, 4,183,131, Cl. 29-434.000.

O'Neil, Charles P.: *See—*
Malecki, Ronald J.; and O'Neil, Charles P., 4,183,374, Cl. 137-624.200.

Ono, Seibei; Shibuya, Kouichi; and Marikawa, Hiroshi, to Dainippon Ink & Chemicals, Inc. Method for clear-coloring of linear aromatic polyester. 4,183,842, Cl. 260-40.00P.

Ooka, Tatuo: *See*—
Shiomura, Tetsunosuke; Ooka, Tatuo; Kobayashi, Takashi; Hagiwara, Kazuo; and Sadotomo, Hideo, 4,184,036, Cl. 528-499.000.
Oosterling, Pieter A.; and van Staveren, Hendricus C., to Vicon N.V. Mowing device. 4,183,196, Cl. 56-295.000.
Oppenlander, Harry; and Naundorf, Peter, to Thyssen Industrie AG. Coupling gear for lemniscate shield timbering frame. 4,183,701, Cl. 405-295.000.
Osaka, Takatoshi: *See*—
Nishimura, Katsuo; Wakabayashi, Hisao; Osaka, Takatoshi; Kume, Kazunari; Ogura, Yasuhiro; and Miya, Yukio, 4,183,629, Cl. 350-334.000.
Osenbaugh, Carl D., to Dana Corporation. Differential mechanism. 4,183,263, Cl. 74-606.00R.
Osumi, Masato: *See*—
Hinotani, Katsuhiro; Kanatani, Keiichi; Osumi, Masato; and Hayama, Hajime, 4,183,351, Cl. 126-443.000.
Osumi, Sinzi, to Kabushiki-Kaisha Fujikoshi. Shaft supporting apparatus for planetary gear reduction device. 4,183,266, Cl. 74-801.000.
Ota, Norio; and Ishida, Fumihiko, to Hitachi, Ltd. Garnet single crystal film for magnetic bubble domain devices. 4,183,999, Cl. 428-336.000.
Otani, Yoshiaki: *See*—
Mukai, Sadayoshi; Otani, Yoshiaki; and Yamaguchi, Osamu, 4,184,190, Cl. 361-315.000.
Otis Engineering Corporation: *See*—
James, Henry J.; and Young, Carter R., 4,183,404, Cl. 166-133.000.
Otterson, Lewis L.: *See*—
Loughley, William A.; and Otterson, Lewis L., 4,183,457, Cl. 229-5.500.
Oude Aarninkhof, Martinus A., to Hazemeijer B.V. Contact device for the transmission of electric current between a stationary contact part and a movable contact part. 4,183,598, Cl. 339-6.00R.
Overhead Door Corporation: *See*—
Bailey, Morris W., 4,183,393, Cl. 160-232.000.
Owen, Howard D.; and Smith, Terence, to Research Council of Alberta, The. Apparatus for progessively removing layers of overburden from an inclined side of a cut. 4,183,586, Cl. 299-43.000.
Owens-Corning Fiberglas Corporation: *See*—
Lawyer, Russell R., 4,184,022, Cl. 521-118.000.
P. R. Mallory & Co. Inc.: *See*—
Barrella, Joseph N., 4,184,012, Cl. 429-94.000.
Dey, Arabinda N.; and Him, James H., 4,184,010, Cl. 429-50.000.
Dey, Arabinda N., 4,184,014, Cl. 429-105.000.
Kelsey, G. Stephen; Dey, Arabinda N.; and Bro, Per, 4,184,017, Cl. 429-197.000.
Packard, Charles E.; Maas, William M.; and Seims, Robert J., to Art's-Way Manufacturing Co., Inc. Combination hay-grain feeder device. 4,183,472, Cl. 241-200.000.
Palamarchuk, Andrei A.: *See*—
Petrovsky, Viktor A.; Gassanov, Lev G.; Belyaev, Sergei M.; Kochetov, Lev A.; Kryzhanovsky, Vitaly L.; Palamarchuk, Andrei A.; Timraleev, Rafail J.; Ushakov, Viktor D.; and Parfenjuk, Vitaly M., 4,184,156, Cl. 343-8.000.
Palmer Engineering Company Ltd.: *See*—
Black, Donald S.; and Palmer, J. Bruce, 4,183,813, Cl. 210-512.00R.
Palmer, J. Bruce: *See*—
Black, Donald S.; and Palmer, J. Bruce, 4,183,813, Cl. 210-512.00R.
Panish, Morton B., to Bell Telephone Laboratories, Incorporated. Light emitting diodes which emit in the infrared. 4,184,171, Cl. 357-18.000.
Paradis, Joseph R., to Dennison Manufacturing Company. Manufacture of fasteners using directive heating during stretching. 4,183,894, Cl. 264-291.000.
Paradis, Rene H.: *See*—
Poirier d'Ange d'Orsay, Emmanuel J.; and Paradis, Rene H., 4,183,397, Cl. 165-14.000.
Parfenjuk, Vitaly M.: *See*—
Petrovsky, Viktor A.; Gassanov, Lev G.; Belyaev, Sergei M.; Kochetov, Lev A.; Kryzhanovsky, Vitaly L.; Palamarchuk, Andrei A.; Timraleev, Rafail J.; Ushakov, Viktor D.; and Parfenjuk, Vitaly M., 4,184,156, Cl. 343-8.000.
Paris, Gerard Y.; Cimon, Denis G.; Bariana, Dilbagh S.; and Fung, Anthony, to Abbott Laboratories. 4-Hydroxy-7-(substituted)-phenylpteridines. 4,183,934, Cl. 424-251.000.
Parker, Norman W., to Motorola, Inc. Compatible single sideband system for AM stereo. 4,184,046, Cl. 179-1.0GS.
Parkes, Colin W.: *See*—
Groszek, Aleksander J.; Parkes, Colin W.; and Windle, Denis, 4,183,757, Cl. 106-14.110.
Parsons, John H.: *See*—
West, Peter J.; and Parsons, John H., 4,183,741, Cl. 71-92.000.
Parziale, John R.: *See*—
Gavin, David F.; Milnes, Frank J.; and Parziale, John R., 4,183,816, Cl. 252-47.500.
Pasarela, Nunzio R.: *See*—
Jang, Choong-Gook; and Pasarela, Nunzio R., 4,183,740, Cl. 71-92.000.
Pascal, Jean-Pierre: *See*—
Giovachini, Jean-Luc; Pascal, Jean-Pierre; and Vendramini, Dante M., 4,183,259, Cl. 74-572.000.
Patel, Raman: *See*—
Coran, Aubert Y.; and Patel, Raman, 4,183,876, Cl. 525-232.000.
Patsch, Manfred; and Hettche, Albert, to BASF Aktiengesellschaft. Pyrazoline compounds. 4,183,851, Cl. 260-239.900.
Patterson, Maurice M.; and Srinivasan, Krishnaswamy, to Shell Oil Company. Gas flow monitor. 4,183,243, Cl. 73-155.000.
Paul-Heinz Wagner Maschinenfabrikation: *See*—
Wagner, Paul-Heinz; Hirtsiefer, Karl-Richard; and Muller, Johann, 4,183,260, Cl. 74-575.000.
Pauley, Reginald W., to Ingersoll-Rand Company. Controlled torque air motor. 4,183,265, Cl. 74-786.000.
Pavlovsky, Lev L.: *See*—
Piterskikh, Georgy P.; Sukhov, Stanislav A.; Rumyantsev, Ivan I.; Pavlovsky, Lev L.; and Frolikov, Ivan I., 4,183,145, Cl. 34-10.000.
Pawloski, Chester E., to Dow Chemical Company, The. N'-(substituted phenyl)-N-(2-(halophenoxy)ethyl)alkylanimidamides. 4,183,957, Cl. 424-326.000.
Payne, Geoffrey, to British Steel Corporation. Furnace seal. 4,183,305, Cl. 110-173.00A.
Payne, William H. Insole for footwear having flexible envelope means. 4,183,155, Cl. 36-44.000.
Paz, George A.: *See*—
Greenly, Robert B.; Paz, George A.; and Tignanelli, Gerald, 4,183,663, Cl. 355-77.000.
Pearce, Stephen L.; and Selman, Gordon L., to Johnson, Matthey & Co., Limited. Cermets. 4,183,746, Cl. 75-234.000.
Peckerar, Martin C.: *See*—
Nagel, David J.; and Peckerar, Martin C., 4,184,078, Cl. 250-492.00A.
Pelliza, Enrique: *See*—
Lindauer, Jerome I.; Munteanu, Marina; Reich, Sharon; and Pelliza, Enrique, 4,184,099, Cl. 313-315.000.
Pennwalt Corporation: *See*—
Vidal, Frederick D.; and Gerrity, Albert B., 4,183,972, Cl. 426-653.000.
Peoples, Patrick J., to Howell Laboratories, Incorporated. Linear flaw detector. 4,184,082, Cl. 250-572.000.
PepsiCo, Inc.: *See*—
Bajaj, Girdhar, 4,183,200, Cl. 57-234.000.
Pergler, Charles C.: *See*—
Karrip, Alexander A.; Wisniewski, Joseph M.; and Pergler, Charles C., 4,183,581, Cl. 297-306.000.
Perrine, Walter E. Toggle actuating, shell loading and ejecting apparatus for hand held guns. 4,183,282, Cl. 89-189.000.
Persson, Inge B., to Forenade Fabriksverken. Expansible sleeve deforms hub bore against shaft. 4,183,688, Cl. 403-31.000.
Pet Aids Ltd., Inc.: *See*—
Lawrence, Frank S., 4,183,328, Cl. 119-156.000.
Peterkin, Stuart M.: *See*—
Simpson, Anthony; Peterkin, Stuart M.; Brooksby, Brian T.; and Murray, Harold J., 4,183,534, Cl. 273-105.100.
Peterson, Reuben E., to Jenoff, Inc. Apparatus for automatically water charging a centrifugal fire pump. 4,183,721, Cl. 417-40.000.
Peterson, Robert A. Trash compactor with cover mounted packing blade. 4,183,295, Cl. 100-53.000.
Peterson, Wesley R., to Singer Company, The. Sewing machine cabinet vibration dampening using rubber magnets. 4,183,593, Cl. 312-21.000.
Petitpierre, Jean C., to Ciba-Geigy Corporation. Pressure- or heat-sensitive recording material and novel chromano compounds used therein. 4,183,553, Cl. 282-27.500.
Petrovsky, Viktor A.; Gassanov, Lev G.; Belyaev, Sergei M.; Kochetov, Lev A.; Kryzhanovsky, Vitaly L.; Palamarchuk, Andrei A.; Timraleev, Rafail J.; Ushakov, Viktor D.; and Parfenjuk, Vitaly M. Doppler radar device for measuring speed of moving objects. 4,184,156, Cl. 343-8.000.
Petrucci, Silvio: *See*—
Easley, Wiley L.; Hoeske, Richard J.; and Petrucci, Silvio, 4,183,673, Cl. 366-76.000.
Petzold, Manfred: *See*—
Eckelt, Michael; Heyden, Rudi; Jaeckel, Manfred; Petzold, Manfred; and Worschech, Kurt, 4,183,875, Cl. 525-6.000.
Pfister, George. Alfalfa separator. 4,183,471, Cl. 241-57.000.
Pfizer Inc.: *See*—
Baxter, Charles A. R.; and Shroot, Braham, 4,183,925, Cl. 424-246.000.
Pfundstein, Donald K.: *See*—
Henn, John I.; and Pfundstein, Donald K., 4,183,419, Cl. 180-243.000.
Pharmachem Corporation: *See*—
Watt, William E. R., 4,183,434, Cl. 206-438.000.
Philipson, Lars H. G.; and Hansson, Gert-Ake G. System and method for transmission of information. 4,184,045, Cl. 178-68.000.
Phillips Petroleum Company: *See*—
McKay, Dwight L., 4,183,803, Cl. 208-120.000.
Politte, Leo L.; and Giroux, Victor A., 4,183,225, Cl. 62-114.000.
Young, Jerry W., 4,183,516, Cl. 271-3.100.
Pierson, Richard: *See*—
Walchle, David L.; and Pierson, Richard, 4,183,613, Cl. 350-65.000.
Pilkington P. E. Limited: *See*—
Rogers, Philip J.; and Roberts, Michael, 4,183,624, Cl. 350-175.00E.
Rogers, Philip J., 4,183,626, Cl. 350-216.000.
Pilkington, Paul E., to Conoco, Inc. Gas production from source rock. 4,183,408, Cl. 166-314.000.
Pinckney Molded Plastics, Inc.: *See*—
Sanders, Ellsworth E.; and Stahl, Edward L., 4,183,491, Cl. 248-346.000.

Pinczewski, Morris: *See*—
Barrett, Edward E.; Lensky, Albert; Olesen, Paul; Becker, Christian F.; Pinczewski, Morris; Febre, Wilfredo; and Hahn, Steven, 4,183,453, Cl. 227-131.000.

Pines, Arthur N.; Johnson, Gordon C.; and Campbell, Fannie L., to Union Carbide Corporation. Treatment of textile fabrics with epoxypolyoxyalkylene modified organosilicones. 4,184,004, Cl. 428-413.000.

Pissiotas, Georg: *See*—
Rohr, Otto; Pissiotas, Georg; and Bohner, Beat, 4,183,743, Cl. 71-100.000.

Piterskikh, Georgy P.; Sukhov, Stanislav A.; Rumyantsev, Ivan I.; Pavlovsky, Lev L.; and Frolikov, Ivan I. Method of spray-drying liquid and pastelike materials and installation for carrying same into effect. 4,183,145, Cl. 34-10.000.

Pitney-Bowes, Inc.: *See*—
Bujese, David P., 4,183,660, Cl. 355-51.000.

Platt, Nicolas W. Illuminated hockey puck. 4,183,536, Cl. 273-128.00R.

Plempel, Manfred: *See*—
Buchel, Karl H.; Kramer, Wolfgang; Plempel, Manfred; and Haller, Ingo, 4,183,940, Cl. 424-273.00R.

Pneumatiques, Caoutchouc Manufacture et Plastiques Kleber-Colombes: *See*—
Romand, Jean C., 4,183,391, Cl. 152-361.00R.

Podlas, Thomas J., to Hercules Incorporated. Method of increasing viscosity of hydroxyalkyl cellulose solutions. 4,183,765, Cl. 106-187.000.

Poe, L. Richard, to Hartwell Corporation. Externally accessible adjuster for flush latches. 4,183,564, Cl. 292-113.000.

Poirier d'Ange d'Orsay, Emmanuel J.; and Paradis, Rene H., to Societe pour l'Equipement de Vehicules; and Societe Anonyme Francaise du Ferodo. Vehicle air conditioning device. 4,183,397, Cl. 165-14.000.

Pokorny, Svatopluk: *See*—
Lim, Drahoslav; Coupek, Jiri; Krivakova, Miroslava; and Pokorny, Svatopluk, 4,184,020, Cl. 521-52.000.

Polaroid Corporation: *See*—
Cook, Gerald H., 4,183,634, Cl. 352-104.000.
Mills, Loring K., 4,183,651, Cl. 354-304.000.

Politte, Leo L.; and Giroux, Victor A., to Phillips Petroleum Company. Process and apparatus to substantially maintain the composition of a mixed refrigerant in a refrigeration system. 4,183,225, Cl. 62-114.000.

Porsche, Ferdinand A.; and Matthias, Jan, to Porsche, Ferdinand Alexander. Portable watch, especially wristwatch. 4,183,206, Cl. 58-152.00C.

Porsche, Ferdinand Alexander: *See*—
Porsche, Ferdinand A.; and Matthias, Jan, 4,183,206, Cl. 58-152.00C.

Portals Limited: *See*—
Tooth, Alan J., 4,183,989, Cl. 428-195.000.

Portman, Homer F. Hickory wood cooking plank. 4,183,291, Cl. 99-425.000.

Potomac Applied Mechanics, Inc.: *See*—
Stubbings, James H., 4,183,239, Cl. 72-391.000.

Potts, Vinson S.: *See*—
Scharf, Jerry F.; and Potts, Vinson S., 4,183,442, Cl. 220-271.000.

Prasch, Dieter: *See*—
Haferkamp, Dirk; Hodzic, Alija; Moser, Paul; and Prasch, Dieter, 4,183,784, Cl. 176-60.000.

Prefco Products, Inc.: *See*—
McCabe, Francis J., 4,183,129, Cl. 29-157.00R.

Procter & Gamble Company, The: *See*—
Mullane, William I., Jr., 4,184,175, Cl. 358-93.000.

Production Machinery Corporation: *See*—
Sellitto, Thomas A.; and White, Allen W., 4,183,799, Cl. 204-206.000.

Puchta, Rolf: *See*—
Kunzel, Werner; Schwadtke, Karl; Cioc, Alexander; Kik, Michael; and Puchta, Rolf, 4,183,981, Cl. 427-242.000.

Pullman Incorporated: *See*—
Adler, Franklin P., 4,183,370, Cl. 137-68.00R.
Gutridge, Jack E.; Miller, Roy W.; and Marulic, Walter J., 4,183,179, Cl. 49-411.000.

Punis, Giancarlo: *See*—
Connery, James G.; DiNapoli, Louis D.; and Punis, Giancarlo, 4,183,245, Cl. 73-194.00A.

Purdue Frederick Company, The: *See*—
Cohen, Sasson; and Fisher, Abraham, 4,183,938, Cl. 424-258.000.

Puri, Rishi R.: *See*—
Collington, Kenneth T.; Puri, Rishi R.; and Gibson, Peter J., 4,183,822, Cl. 252-350.000.

Quartara, Patrizia, to Fonderia R. Bertoldo & C. S.a.s. Rotating face sealing gasket, particularly for use on tracked vehicles. 4,183,542, Cl. 277-92.000.

Queneau, Paul B.: *See*—
Sherwood, Willam G.; and Queneau, Paul B., 4,183,792, Cl. 204-96.000.

Quick, Lloyd A., to Warner-Lambert Company. Apparatus and process for cleaning filled capsules. 4,183,770, Cl. 134-6.000.

Quick-Rotan Becker & Notz KG: *See*—
Angersbach, Wolfgang; and Scharffetter, Jurgen, 4,183,312, Cl. 112-277.000.

Raber, Peter E.; and Gordon, Jason M., to United Technologies Corporation. Optical inspection system employing spherical mirror. 4,183,672, Cl. 356-376.000.

Raby, Peter T. C.: *See*—
Taylor, Terrence F. E.; Bansal, Vishwa N.; and Raby, Peter T. C., 4,184,169, Cl. 346-140.00R.

Raco Inc.: *See*—
Esoldi, Vincent F., 4,183,486, Cl. 248-205.00R.

Radimerski, Paul; and Rusek, Milos, to Ciba-Geigy Corporation. Process for the preparation of 2,6-dialkyl-N-alkylanilines. 4,183,868, Cl. 260-573.000.

Raffarin, John E.: *See*—
Chadwick, Curt H.; and Raffarin, John E., 4,183,483, Cl. 248-421.000.

Raffel, Jack I.; and Bernacki, Stephen E., to Massachusetts Institute of Technology. Dielectric isolation using shallow oxide and polycrystalline silicon. 4,184,172, Cl. 357-50.000.

Rajagopalan, Parthasarathi, to Endo Laboratories, Inc. Pyridopyrrolobenzheterocycles. 4,183,936, Cl. 424-256.000.

Ramachandran, Sundaresan, to Union Carbide Corporation. Asbestos composition having organo-silane coating. 4,183,814, Cl. 252-8.50C.

Rambausek, Hugo, to Heidelberger Druckmaschinen Aktiengesellschaft. Drive system for sheet-fed rotary printing presses with tandem-mounted printing units. 4,183,296, Cl. 101-181.000.

Rambauske, Werner R., to Raytheon Company. Optical apparatus. 4,183,664, Cl. 356-4.000.

Ramsland, David G.: *See*—
Cannalte, Gary A.; and Ramsland, David G., 4,184,118, Cl. 325-183.000.

Randolph, Alan D., to University Patents, Inc. Apparatus and method for determining crystallization properties of urine. 4,183,729, Cl. 23-230.00B.

Rank Organisation Limited, The: *See*—
Millward, John D., 4,184,177, Cl. 358-214.000.

Ranz, Erwin: *See*—
Kuffner, Karl; Lassig, Wolfgang; Meier, Ernst; Ranz, Erwin; and Schranz, Karl-Wilhelm, 4,183,752, Cl. 430-382.000.

Rao, Vemulapalli D. N., to Ford Motor Company. Heat exchanger for Stirling engine. 4,183,213, Cl. 60-517.000.

Raschack, Manfred: *See*—
Binnig, Fritz; Friedrich, Ludwig; Hofmann, Hans P.; Kreiskott, Horst; Mueller, Claus; and Raschack, Manfred, 4,183,935, Cl. 424-256.000.

Rathman, Terry L.: *See*—
Wolfe, James F.; and Rathman, Terry L., 4,183,931, Cl. 424-251.000.

Rau, Eric: *See*—
Ilardi, Joseph M.; and Rau, Eric, 4,183,901, Cl. 423-206.00T.

Rawson, Eric G.: *See*—
Burnham, Robert D.; Scifres, Donald R.; and Rawson, Eric G., 4,184,170, Cl. 357-17.000.

Raytheon Company: *See*—
Rambauske, Werner R., 4,183,664, Cl. 356-4.000.

RCA Corporation: *See*—
Aschwanden, Felix, 4,184,174, Cl. 358-31.000.
Grill, Gerald P.; and Doner, Claude E., 4,184,123, Cl. 330-56.000.
Woodward, Oakley M., 4,184,163, Cl. 343-742.000.

Rea, Irvin B.; and Slavin, Michael, to Lectron Products, Inc. Driver circuit for tone generator. 4,183,278, Cl. 84-1.240.

Reau, Jean-Maurice; Levasseur, Alain; Fouassier, Claude; Cales, Bernard; and Hagenmuller, Paul, to Compagnie Generale d'Electricite S.A. Amorphous cationic conductors. 4,184,015, Cl. 429-193.000.

Reed, Bradley O., to General Electric Company. Hydromechanical transmissions having one-way devices to bridge efficiency discontinuities. 4,183,264, Cl. 74-720.500.

Reese, Paul B.; and Murphy, David W., to United States of America, National Aeronautics and Space Administration. Pressure limiting propellant actuating system. 4,183,217, Cl. 60-632.000.

Regan, A. Michael: *See*—
Watkins, Bruce J.; Regan, A. Michael; and Slata, William P., 4,183,562, Cl. 285-405.000.

Regan Offshore International, Inc.: *See*—
Watkins, Bruce J.; Regan, A. Michael; and Slata, William P., 4,183,562, Cl. 285-405.000.

Regehr, John L.: *See*—
Heiling, Gerald M.; Knappe, LaVerne F.; and Regehr, John L., 4,184,063, Cl. 219-216.000.

Regie Nationale des Usines Renault: *See*—
Mauller, Christian, 4,184,109, Cl. 318-622.000.

Reich, Sharon: *See*—
Lindauer, Jerome I.; Munteanu, Marina; Reich, Sharon; and Pelliza, Enrique, 4,184,099, Cl. 313-315.000.

Reimer, Paul. Versatile collapsible fishing rod. 4,183,163, Cl. 43-24.000.

Reiniche, Andre; and Sauvage, Philippe, to Compagnie Generale des Etablissements Michelin. Undulated metallic elements for the reinforcement of composite materials. 4,184,002, Cl. 428-603.000.

Rekers, Louis J.; Katzen, Stanley J.; and Krekeler, Jerome H., to National Petro Chemicals Corporation. Olefin Polymerization catalyst. 4,184,028, Cl. 526-105.000.

Renfroe, Charles J., to J. C. Renfroe and Sons, Inc. Screw-type lifting clamp. 4,183,571, Cl. 294-101.000.

Renholt, George, Jr.: *See*—
Burke, Richard J.; and Renholt, George, Jr., 4,183,301, Cl. 102-13.000.

Renner, Hermann: *See*—
Klie, Wolfgang; Renner, Hermann; Weidemann, Dieter; and Weisshappel, Helmut, 4,183,574, Cl. 296-188.000.

Repa Feinstanzwerk GmbH: *See*—
Fohl, Artur, 4,183,476, Cl. 242-107.000.

Research Corporation: *See*—
Wolfe, James F.; and Rathman, Terry L., 4,183,931, Cl. 424-251.000.
Research Council of Alberta, The: *See*—
George, Zacheria M., 4,183,823, Cl. 252-411.00S.
Owen, Howard D.; and Smith, Terence, 4,183,586, Cl. 299-43.000.
Resnick, Bruce M.: *See*—
Brown, Michael J.; Resnick, Bruce M.; and Woodland, James H. R., 4,183,958, Cl. 424-326.000.
Reynolds, James R., to Milliken Research Corporation. Four belt conveying mechanism for tubular knit gumming and slitting machine. 4,183,318, Cl. 118-34.000.
Reynolds, Steven C. Insulation presence sensing probe. 4,183,246, Cl. 73-290.00R.
Reynolds, William D., to Carrier Corporation. Lanced tube joint process. 4,183,455, Cl. 228-170.000.
Rhone Poulenc Industries: *See*—
Fabre, Jean-Louis; Farge, Daniel; and James, Claude, 4,183,944, Cl. 424-275.000.
Riccitiello, Salvatore R.: *See*—
United States of America, National Aeronautics and Space Administration; Sawko, Paul M.; Riccitiello, Salvatore R.; and Hamermesh, Charles L., 4,184,021, Cl. 521-106.000.
Richert, Raymond, to U.S. Philips Corporation. Detachable head appliance driven by an electric motor. 4,184,088, Cl. 310-17.000.
Richter Gedeon Vegyeszeti Gyar Rt.: *See*—
Noteisz, Ferenc; Bartok, Mihaly; Felfoldi, Karoly; Karpati, Egon; and Szporny, Laszlo, 4,184,040, Cl. 546-342.000.
Schon, Istvan; Kisfaludy, Lajos; Varro, Vince; Varga, Laszlo; and Nafradi, Jozsef, 4,183,909, Cl. 424-9.000.
Rickenbach, Jakob: *See*—
Neuweiler, Armin; and Rickenbach, Jakob, 4,183,473, Cl. 242-20.000.
Rickenbacker, James E., to Exxon Production Research Company. Measurement and control of the output force of a seismic vibrator. 4,184,144, Cl. 367-137.000.
Ricoh Company, Ltd.: *See*—
Isayama, Takuro; and Sato, Tsutomu, 4,184,168, Cl. 346-140.00R.
Satomi, Toyokazu; Kudoh, Kunio; and Sakurai, Tetsuo, 4,183,653, Cl. 355-3.0SH.
Umahashi, Minoru; Yamazaki, Hideo; Hasebe, Mitsuo; and Yamashita, Tadashi, 4,183,655, Cl. 355-3.0TR.
Yanagawa, Nobuyuki, 4,183,652, Cl. 355-3.0DR.
Rieselman, Robert H., to Concept Inc. Dental stain remover. 4,183,140, Cl. 32-59.000.
Rima Enterprises: *See*—
Steinhart, Horst K., 4,183,704, Cl. 414-31.000.
Ringwood, Robert C., Jr.: *See*—
Larkin, William A.; and Ringwood, Robert C., Jr., 4,183,846, Cl. 260-45.75S.
Roberson, Wayne J.: *See*—
Moery, Richard B.; and Roberson, Wayne J., 4,183,690, Cl. 403-59.000.
Robert Bosch GmbH: *See*—
Beckers, Hans; Jung, Paul-Werner; Bovians, Herbert; Heyer, Johann M., deceased; Heyer, Hans P., heir; and Wanders, Marlene, heir, 4,183,968, Cl. 426-512.000.
Esper, Friedrich J.; and Friese, Karl-Hermann, 4,183,798, Cl. 204-195.00S.
Roberts, Michael: *See*—
Rogers, Philip J.; and Roberts, Michael, 4,183,624, Cl. 350-175.00E.
Robertson, Robert B.: *See*—
Kiefer, Edward; and Robertson, Robert B., 4,183,178, Cl. 49-375.000.
Robota, Stephen: *See*—
Baxamusa, Yusuf A.; and Robota, Stephen, 4,183,873, Cl. 260-651.00F.
Rockwell International Corporation: *See*—
Gehle, Richard W., 4,184,133, Cl. 333-238.000.
Rod, Robert L., to Monogram Industries, Inc. Directive loop antenna. 4,184,164, Cl. 343-744.000.
Rodon, Maria, to Beecham Inc. Oral compositions. 4,183,916, Cl. 424-54.000.
Roeder, George K. Downhole jet pumps. 4,183,722, Cl. 417-172.000.
Roesler, Frank C.; Hines, David A.; Maslen, Frank P.; and Fawcett, Richard, to Imperial Chemical Industries Limited. Circulation of gas/liquid mixtures. 4,183,787, Cl. 435-43.000.
Roessler, Peter: *See*—
Hamprecht, Rainer; Hartmann, Alfons; Klauke, Erich; Hammann, Ingeborg; Roessler, Peter; and Brandes, Wilhelm, 4,183,949, Cl. 424-304.000.
Rogers, Philip J.; and Roberts, Michael, to Pilkington P. E. Limited. Lenses. 4,183,624, Cl. 350-175.00E.
Rogers, Philip J., to Pilkington P. E. Limited. Lenses. 4,183,626, Cl. 350-216.000.
Rogers, Roy E., to Weyerhaeuser Company. Method and apparatus for making a can end seam. 4,183,315, Cl. 113-18.00R.
Rohm and Haas Company: *See*—
Meteyer, Thomas E.; and Fries, William, 4,184,019, Cl. 521-34.000.
Smiley, Leonard H.; and Tigelaar, Howard L., 4,183,991, Cl. 428-220.000.
Taylor, Ronald, 4,183,922, Cl. 424-211.000.
Weir, W. David; and Kilbourn, Edward E., 4,183,921, Cl. 424-200.000.
Rohr, Otto; Pissiotas, Georg; and Bohner, Beat, to Ishihara Sangyo Kaisha Ltd. Novel herbicidally active, nuclear-substituted phenoxyphenoxy-alkanecarboxylic acid derivatives and use thereof for controlling grass-like weeds. 4,183,743, Cl. 71-100.000.
Rolair Systems, Inc.: *See*—
Burdick, Robert E., 4,183,710, Cl. 414-671.000.
Roland Offsetmaschinenfabrik: *See*—
Cappel, Bert, 4,183,299, Cl. 101-415.100.
Roland Offsetmaschinenfabrik Faber & Schleicher AG: *See*—
Cappel, Bert; Mayer, Peter; Wirz, Burkhardt; and Decker, Peter, 4,183,298, Cl. 101-348.000.
Rolfe, Richard B., to Southern California Edison Company. Crystalline calcium sulfate dihydrate and process for making same. 4,183,908, Cl. 423-555.000.
Rolls-Royce Limited: *See*—
Snell, Leonard S., 4,183,210, Cl. 60-204.000.
Romand, Jean C., to Pneumatiques, Caoutchouc Manufacture et Plastiques Kleber-Colombes. Vehicle tire. 4,183,391, Cl. 152-361.00R.
Romeo, Ciriaco: *See*—
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Doria, Gianfederico; Romeo, Ciriaco; Lauria, Francesco; Corno, Maria L.; Giraldi, Piernicola; and Tibolla, Marcello, 4,183,946, Cl. 424-283.000.
Romey, Ingo, to Bergwerksverband GmbH. Process for the production of coke from pitch. 4,183,802, Cl. 208-88.000.
Roop, Stephen S. Football game played with aerial projectiles. 4,183,530, Cl. 273-94.00R.
Roos, Roland H. W.: *See*—
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Root, Raymond C. Lettering guide. 4,183,143, Cl. 33-184.500.
Roper Corporation: *See*—
Bance, Jean A., 4,183,190, Cl. 52-648.000.
Rosaen, Borje O.; and Fosdick, Dale P. Fluid filtering device. 4,183,812, Cl. 210-131.000.
Rosenmund AG: *See*—
Ehrke, Rainer, 4,183,398, Cl. 165-53.000.
Rosenthale, Marvin E., to American Home Products Corporation. Inhalation therapy for relieving bronchial spasm using quaternary salts of promethazine. 4,183,912, Cl. 424-45.000.
Ross, Richard H. C. L. Zinc extraction method. 4,183,794, Cl. 204-119.000.
Ross, Roger E. Flying disk toy. 4,183,168, Cl. 46-60.000.
Rossmy, Gerd: *See*—
Theile, Heinz; Hoffmann, Hermann; Rossmy, Gerd; Koerner, Gotz; and Zaske, Peter, 4,183,820, Cl. 252-342.000.
Rossollin, Jean-Claude M. M., to United Patents Trust Reg.-U.P.T. Method for folding sheet-shaped plastic material and folded sheet-shaped plastic material obtained by carrying out this method. 4,183,891, Cl. 264-154.000.
Rotter, Gerhard; and Roos, Roland H. W., to BASF Aktiengesellschaft. Drop-out compensator for sound reproducing apparatus during tape reversal. 4,184,178, Cl. 360-27.000.
Rotunda, Orlo. Method of assembly of a solar energy device including a duct-collector. 4,183,130, Cl. 29-157.30R.
Route, Rodney: *See*—
Biletch, Harry A.; Route, Rodney; and Zomlefer, Jack, 4,183,878, Cl. 525-86.000.
Rubens, Roger W., to National Starch and Chemical Corporation. Foodstuffs containing crosslinked starches using STMP. 4,183,969, Cl. 426-578.000.
Rudolph, Peter K. C., to Boeing Company, The. Jet thrust reverser. 4,183,478, Cl. 244-110.00B.
Rudy, Marion F., to Bogert, Robert C., a part interest. Insole construction for articles of footwear. 4,183,156, Cl. 36-44.000.
Rule, Adrian O., III; and Bartley, William E., III, to Integrated Development and Manufacturing. Method and apparatus for temperature and humidity control within a chamber. 4,183,224, Cl. 62-91.000.
Rumyantsev, Ivan I.: *See*—
Piterskikh, Georgy P.; Sukhov, Stanislav A.; Rumyantsev, Ivan I.; Pavlovsky, Lev L.; and Frolikov, Ivan I., 4,183,145, Cl. 34-10.000.
Rumyantsev, Leonid A.; Esenovsky-Lashkov, Jury K.; Lisevich, Anatoly A.; Kanevsky, Jury L.; Steshenko, Vladimir P.; Guba, Vladimir I.; Abramian, Vladimir A.; Tronin, Jury A.; Fedorov, Petr V.; Nazarov, Boris B.; and Mironenko, Mikhail A. Vehicle gear-change lever with clutchswitch. 4,183,424, Cl. 192-3.580.
Rusek, Milos: *See*—
Radimerski, Paul; and Rusek, Milos, 4,183,868, Cl. 260-573.000.
Rush, Derek A., to Smiths Industries Limited. Couplings and terminals for optical waveguides. 4,183,615, Cl. 350-96.210.
Rush, Derek A.; and Thornton, Anthony J., to Smiths Industries Limited. Couplings and terminals for optical waveguides. 4,183,618, Cl. 350-96.180.
Russell, James R. Self-retracting measuring device with wiping system for oil sumps and other containers. 4,183,142, Cl. 33-126.70R.
Russell, Robert B. Interferometer. 4,183,670, Cl. 356-350.000.
Russo, Ronald D. Respiratory exercising device. 4,183,361, Cl. 128-725.000.
RWB Labs: *See*—
West, Roger A., 4,183,248, Cl. 73-362.0AR.
Rybin, Igor V.: *See*—
Vulis, Mikhail L.; Rybin, Igor V.; Shenderovich, Pavel B.; Golenchenko, Valery A.; Shevchenko, Igor S.; and Schedrin, Vladimir G., 4,184,042, Cl. 174-15.00S.

S.R.C. Laboratories, Inc.: *See*—
Morales, John J., 4,184,098, Cl. 313-95.000.
Sadotomo, Hideo: *See*—
Shiomura, Tetsunosuke; Ooka, Tatuo; Kobayashi, Takashi; Hagiwara, Kazuo; and Sadotomo, Hideo, 4,184,036, Cl. 528-499.000.
Safi-Societe des Accumulateurs Fixes et de Traction: *See*—
Lecerf, Andre, 4,184,016, Cl. 429-194.000.
Sagae, Shigeru: *See*—
Sudo, Kyosuke; Hasunuma, Hisao; Yamaoka, Takahiro; and Sagae, Shigeru, 4,183,592, Cl. 308-187.200.
Sagara, Takao: *See*—
Miyamoto, Hiroshi; Yamaji, Tadao; Nakajima, Toshi; and Sagara, Takao, 4,183,561, Cl. 285-321.000.
Sagawa, Akio; Suzuki, Masayoshi; and Ito, Tetsuo, to Hitachi, Ltd. Semiconductor switch. 4,184,086, Cl. 307-252.00J.
Sageman, David R.: *See*—
Mitchell, David S.; and Sageman, David R., 4,183,800, Cl. 208-8.00R.
Sahara, Hiroshi; Tanaka, Yutaka; and Isobe, Toshinobu, to Sony Corporation. Amplifier having different low-frequency and high-frequency feedback networks. 4,184,176, Cl. 358-184.000.
Saint-Gobain Industries: *See*—
Meunier, Jean-Paul; Joachim, Jacky; and Kafka, Bernard, 4,183,832, Cl. 260-17.300.
St. Peter, Albert L. Dressing a rock face for abandonment. 4,183,584, Cl. 299-13.000.
Saito, Shozo; and Inoue, Naoyuki. Double effect absorption refrigerating system comprising. 4,183,228, Cl. 62-497.000.
Saito, Takashi, to Victor Company of Japan, Ltd. Automatic record playing apparatus. 4,183,538, Cl. 274-15.00R.
Sakai, Masahiro: *See*—
Hoshino, Yoshiaki; Hatta, Tokuaki; and Sakai, Masahiro, 4,183,761, Cl. 106-69.000.
Sakai, Yoshiharu: *See*—
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Sakamoto, Masahide: *See*—
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Sakata, Kimio: *See*—
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Sakurai, Tetsuo: *See*—
Satomi, Toyokazu; Kudoh, Kunio; and Sakurai, Tetsuo, 4,183,653, Cl. 355-3.0SH.
Sakurai, Yasuo; and Kusumoto, Koji, to Ashimori Kogyo Kabushiki Kaisha. Apparatus for coating hose. 4,183,319, Cl. 118-44.000.
Salomon, Georges P. J., to Etablissements Francois Salomon et Fils. Safety binding with manual release. 4,183,549, Cl. 280-632.000.
Samanta, Mrinmay: *See*—
Macedo, Pedro B.; Samanta, Mrinmay; and Simmons, Joseph H., 4,183,620, Cl. 350-96.300.
Samcoe Holding Corporation: *See*—
Frezza, Robert, 4,183,151, Cl. 34-155.000.
Sanders, Ellsworth E.; and Stahl, Edward L., to Pinckney Molded Plastics, Inc. Reinforced pallet. 4,183,491, Cl. 248-346.000.
Sandford, Maynard C.; and Gray, David L., to United States of America, National Aeronautics and Space Administration. Solar cell angular position transducer. 4,184,072, Cl. 250-231.0SE.
Sandoz Ltd.: *See*—
Bastian, Jean-Michel, 4,183,943, Cl. 424-275.000.
Sandvik AB: *See*—
Levefelt, Bert G., 4,183,417, Cl. 175-339.000.
Saneyoshi, Norio, to Iwasaki Tsushinki Kabushiki Kaisha. Ringing signal detector. 4,184,053, Cl. 179-84.00R.
Sano, Yoshikazu: *See*—
Shibata, Shin-ichi; Sato, Yasuji; Sano, Yoshikazu; and Yamamoto, Takao, 4,184,054, Cl. 179-99.00M.
Santoro, Giovanni, to Werbetronic A.G. Control mechanism for the movements of a tape cassette in a tape cassette recorder. 4,184,182, Cl. 360-96.600.
Sanyo Electric Co. Ltd.: *See*—
Hinotani, Katsuhiro; Kanatani, Keiichi; Osumi, Masato; and Hayama, Hajime, 4,183,351, Cl. 126-443.000.
Sapkus, Jurgis: *See*—
Lewis, J. Stephen; and Sapkus, Jurgis, 4,183,172, Cl. 46-122.000.
Sargent, Clarence. Air-supported shelter system. 4,183,184, Cl. 52-2.000.
Sartori, Guido: *See*—
Melchior, Michael T.; Milliman, George E.; and Sartori, Guido, 4,183,903, Cl. 423-226.000.
Sasaki, Makoto: *See*—
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Sasaki, Naoki: *See*—
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Sasaki, Toshio: *See*—
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Sasatani, Takashi: *See*—
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Sasse, Klaus; Beck, Gunther; Eue, Ludwig; and Schmidt, Robert R., to Bayer Aktiengesellschaft. 4,5-Dichloro-imidazole-1-carboxylic acid aryl esters and their use as plant protection agents. 4,183,742, Cl. 71-92.000.
Satake, Kunio: *See*—
Ibaragi, Toshio; Satake, Kunio; Yamada, Tsuyoshi; and Hayakawa, Kiyoshi, 4,183,877, Cl. 525-70.000.
Sato, Fumitaka, to Tokyo Shibaura Electric Co., Ltd. Fault-diagnosing method for an electronic computer. 4,183,461, Cl. 235-304.000.
Sato, Masamichi; and Miyazuka, Hajime, to Xerox Corporation. Color electrophotographic liquid developer of colored particles and zinc oxide. 4,183,818, Cl. 430-115.000.
Sato, Shuichi, to Singer Company, The. Feed control device for use in a sewing machine. 4,183,314, Cl. 112-316.000.
Sato, Takuo: *See*—
Adachi, Shichiro; Takayama, Suguru; and Sato, Takuo, 4,183,829, Cl. 252-466.0PT.
Sato, Tsutomu: *See*—
Isayama, Takuro; and Sato, Tsutomu, 4,184,168, Cl. 346-140.00R.
Sato, Yasuji: *See*—
Shibata, Shin-ichi; Sato, Yasuji; Sano, Yoshikazu; and Yamamoto, Takao, 4,184,054, Cl. 179-99.00M.
Satomi, Toyokazu; Kudoh, Kunio; and Sakurai, Tetsuo, to Ricoh Company, Ltd. Sheet stripper for an electrostatographic apparatus. 4,183,653, Cl. 355-3.0SH.
Satterwhite, Charles R., to Unit Rig & Equipment Co. Conveyor folding and deflector operation for excavating and loading systems. 4,183,158, Cl. 37-190.000.
Saurer, Eric: *See*—
Laesser, Claude; Viennet, Rene; and Saurer, Eric, 4,183,628, Cl. 350-338.000.
Sauter, Roland. Means for supporting clockwork elements of clocks. 4,183,204, Cl. 58-126.00R.
Sauvage, Philippe: *See*—
Reiniche, Andre; and Sauvage, Philippe, 4,184,002, Cl. 428-603.000.
Sauvey, Donald R.: *See*—
Bione, Angelo A.; and Sauvey, Donald R., 4,183,276, Cl. 84-1.030.
Sawko, Paul M.: *See*—
United States of America, National Aeronautics and Space Administration; Sawko, Paul M.; Riccitiello, Salvatore R.; and Hamermesh, Charles L., 4,184,021, Cl. 521-106.000.
Scarbrough, John D., Jr. Antenna system for a motor vehicle. 4,184,161, Cl. 343-713.000.
Schaas, Gerhard, to Loewe-Opta GmbH. Vertical deflection circuit for a television receiver. 4,184,106, Cl. 315-403.000.
Schaefft, Hans. Mobile power shovel. 4,183,711, Cl. 414-695.000.
Schaffer, Dennis A., to Carmet Company. Method of making aluminum cans. 4,183,237, Cl. 72-349.000.
Scharf, Jerry F.; and Potts, Vinson S., to Crown, Cork & Seal Company, Inc. Container closure having pull-tab opening means. 4,183,442, Cl. 220-271.000.
Scharffetter, Jurgen: *See*—
Angersbach, Wolfgang; and Scharffetter, Jurgen, 4,183,312, Cl. 112-277.000.
Schedrin, Vladimir G.: *See*—
Vulis, Mikhail L.; Rybin, Igor V.; Shenderovich, Pavel B.; Golenchenko, Valery A.; Shevchenko, Igor S.; and Schedrin, Vladimir G., 4,184,042, Cl. 174-15.00S.
Scheffel, Walter. Apparatus for weft insertion in a weaving loom. 4,183,382, Cl. 139-435.000.
Schellhammer, Carl-Wolfgang: *See*—
Schroeder, Josef; and Schellhammer, Carl-Wolfgang, 4,183,853, Cl. 260-239.650.
Schenk, Peter C.: *See*—
Green, Robert B.; Keller, Richard A.; Luther, Gabriel G.; Schenk, Peter C.; and Travis, John C., 4,184,127, Cl. 331-94.50S.
Schering AG: *See*—
Nusslein, Ludwig; and Arndt, Friedrich, 4,183,739, Cl. 71-90.000.
Schering Corporation: *See*—
Gold, Elijah H.; and Solomon, Daniel M., 4,183,923, Cl. 424-241.000.
Green, Michael J.; and Tiberi, Robert, 4,183,924, Cl. 424-242.000.
Schick, Karl G.; and Huber, Calvin O. Method of forming amperometric sensor with transition metal oxide/hydroxide electrodes. 4,183,791, Cl. 204-56.00R.
Schiffman, Louis. Zinc chromium chromate pigment. 4,183,758, Cl. 106-14.050.
Schilling, William F.; Beltran, Adrian M.; and Muth, Myron C., to General Electric Company. Method of fabricating liquid cooled gas turbine components. 4,183,456, Cl. 228-175.000.
Schillreff, George H., to General Dynamics Pomona Division. Sequential burst system. 4,183,302, Cl. 102-89.0CD.
Schlichting, David A.: *See*—
Soldati, Gianluigi; Schlichting, David A.; and Finkelstein, Paul, 4,184,039, Cl. 544-12.000.
Schlotzhauer, Allan T.: *See*—
Knabe, Herbert; Schlotzhauer, Allan T.; and Scott, Michael A., 4,184,003, Cl. 428-411.000.
Schmidt, Robert A. Laser resistance trimmer. 4,184,062, Cl. 219-121.00L.
Schmidt, Robert R.: *See*—
Sasse, Klaus; Beck, Gunther; Eue, Ludwig; and Schmidt, Robert R., 4,183,742, Cl. 71-92.000.
Schmidt, Rolf D.; and Theodore, Earl M., to Sharpoint, Inc. Access suture package. 4,183,431, Cl. 206-63.300.
Schmitt, Frederick L.: *See*—
Mookherjee, Braja D.; Trenkle, Robert W.; Vock, Manfred H.; Luccarelli, Domenick, Jr.; Schmitt, Frederick L.; Stork, Gilbert;

MacDonald, Timothy; and Liberman, Arthur L., 4,183,965, Cl. 426-548.000.
Schneckloth, Raymond C. Trailer hitch with an interchangeable rotative portion. 4,183,548, Cl. 280-433.000.
Scholten, Frank L.: *See*—
Booth, Thomas A.; and Scholten, Frank L., 4,183,638, Cl. 354-7.000.
Schon, Istvan; Kisfaludy, Lajos; Varro, Vince; Varga, Laszlo; and Nafradi, Jozsef, to Richter Gedeon Vegyeszeti Gyar Rt. Phenylglycine-containing new peptides with gastrine effects and a process for the preparation thereof. 4,183,909, Cl. 424-9.000.
Schonmeier, Herbert, to Jagenberg Werke AG. Apparatus for winding material in web form. 4,183,474, Cl. 242-66.000.
Schott, Walter: *See*—
Waschk, Fritz; Webersik, Heinz; Maurischat, Gunther; and Schott, Walter, 4,183,654, Cl. 355-3.0FU.
Schrader, Charles D.: *See*—
Broyles, Marshall W.; and Schrader, Charles D., 4,183,570, Cl. 294-61.000.
Schranz, Karl-Wilhelm: *See*—
Kuffner, Karl; Lassig, Wolfgang; Meier, Ernst; Ranz, Erwin; and Schranz, Karl-Wilhelm, 4,183,752, Cl. 430-382.000.
Schreiber, Ronald S.: *See*—
Wixon, Harold E.; and Schreiber, Ronald S., 4,183,815, Cl. 252-8.800.
Schroeder, Josef; and Schellhammer, Carl-Wolfgang, to Bayer Aktiengesellschaft. 1-[p-(2-Trialkylammonium)propylsulfonylphenyl]-3-(phenyl)-pyrazoline salts. 4,183,853, Cl. 260-239.650.
Schroeder, Walter W., to Sprague Electric Company. Electrolytic capacitor cover-terminal assembly. 4,183,600, Cl. 339-218.00R.
Schubert & Salzer: *See*—
Schumann, Fritz, 4,183,199, Cl. 57-89.000.
Schumann, Fritz, to Schubert & Salzer. Apparatus for bringing to rest the rotor of an open-end spinning device. 4,183,199, Cl. 57-89.000.
Schutten, Herman P.: *See*—
Jaskolski, Stanley V.; Lade, Robert W.; Schutten, Herman P.; and Spellman, Gordon B., 4,184,126, Cl. 331-66.000.
Schwab, Milton I.: *See*—
Spitz, Albert W.; and Schwab, Milton I., 4,183,307, Cl. 110-235.000.
Schwadtke, Karl: *See*—
Kunzel, Werner; Schwadtke, Karl; Cioc, Alexander; Kik, Michael; and Puchta, Rolf, 4,183,981, Cl. 427-242.000.
Schwanhausser & Co. Schwan-Bleistift Fabrik: *See*—
Hofmann, Hans J.; and Jankewitz, Axel, 4,183,685, Cl. 401-202.000.
Schwartz, Geraldine C.: *See*—
Eldridge, Jerome M.; Lee, Wen-yaung; and Schwartz, Geraldine C., 4,183,781, Cl. 156-643.000.
Schwarz, Alois: *See*—
Mautz, Karlheinz; Weiland, Emil; and Schwarz, Alois, 4,183,718, Cl. 416-134.00A.
Schwemmer, Leonard J., to Lord Corporation. Liquid filled flexible sealing joint. 4,183,556, Cl. 285-51.000.
Scifres, Donald R.: *See*—
Burnham, Robert D.; Scifres, Donald R.; and Rawson, Eric G., 4,184,170, Cl. 357-17.000.
Sclafani, Augustus S.; Kirschbaum, Nathan; and Tauby, William C., to Grumman Aerospace Corporation. Variable attitude aircraft crew station. 4,183,479, Cl. 244-121.000.
SCM Corporation: *See*—
Battiste, David R., 4,183,879, Cl. 260-932.000.
Bonsack, James P., 4,183,899, Cl. 423-79.000.
Scott, Michael A.: *See*—
Knabe, Herbert; Schlotzhauer, Allan T.; and Scott, Michael A., 4,184,003, Cl. 428-411.000.
Scovill Manufacturing Company: *See*—
Stevens, William, 4,183,563, Cl. 292-34.000.
Sears Manufacturing Company: *See*—
Koutsky, L. John, 4,183,493, Cl. 248-430.000.
Security Patrols Co., Ltd.: *See*—
Iida, Makoto, 4,183,409, Cl. 169-11.000.
Seebald, John W. Pyro-processing rotary kiln mixing rod. 4,183,726, Cl. 432-13.000.
Seehausen, Jobst W., to Ionics, Inc. Heat pipe recuperator. 4,183,399, Cl. 165-103.000.
Seelbach, Hans E. Input device for input of alphanumeric characters into a computer. 4,184,147, Cl. 340-146.3SY.
Segawa, Takashi, to Shimano Industrial Company Limited. Gear crank for a bicycle. 4,183,262, Cl. 74-594.200.
Seifert, Rolf. Heat exchanger. 4,183,400, Cl. 165-107.00R.
Seigal, Steven D.: *See*—
Ernst, Larry M.; Seigal, Steven D.; and Van Cleave, George W., 4,183,657, Cl. 355-14.00R.
Seims, Robert J.: *See*—
Packard, Charles E.; Maas, William M.; and Seims, Robert J., 4,183,472, Cl. 241-200.000.
Seith, Robert T.: *See*—
Benstead, Bryan C.; and Seith, Robert T., 4,183,993, Cl. 428-253.000.
Sekiguchi, Shizuo; Nagano, Katsumasa; and Kitano, Kyozo, to Lion Fat & Oil Co., The. Method for preparation of internal olefin sulfonate. 4,183,867, Cl. 260-513.00T.
Sekisui Kagaku Kogyo Kabushiki Kaisha: *See*—
Takahashi, Minoru; Ishii, Osamu; Naito, Masanori; Kusuhara, Yoshinobu; and Imahigshi, Naofumi, 4,183,840, Cl. 260-37.00R.
Selas Corporation of America: *See*—
Cook, Eugene A.; and Gottschlich, Chad F., 4,183,983, Cl. 427-321.000.
Self-Powered Lighting, Ltd.: *See*—
Hegarty, William, 4,183,595, Cl. 316-30.000.
Sellitto, Thomas A.; and White, Allen W., to Production Machinery Corporation. Apparatus for plating a layer onto a metal strip. 4,183,799, Cl. 204-206.000.
Selman, Gordon L.: *See*—
Pearce, Stephen L.; and Selman, Gordon L., 4,183,746, Cl. 75-234.000.
Senjo, Teizo: *See*—
Hashimoto, Noboru; Senjo, Teizo; and Kobayashi, Makio, 4,183,902, Cl. 423-210.000.
Sentinger, Egon: *See*—
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Sera, Mikio: *See*—
Tahara, Yasuteru; Minami, Shunsuke; Oda, Masaharu; and Sera, Mikio, 4,183,666, Cl. 356-73.100.
Setzer, William C.; Hardy, Ronald G.; and Winter, Joseph, to Swiss Aluminium Ltd. Process for making aluminum alloy conductor wire. 4,183,771, Cl. 148-2.000.
Seuref A.G.: *See*—
Bertelli, Aldo, 4,183,954, Cl. 424-319.000.
Seya, Seiichi; Omori, Masao; and Sakamoto, Masahide, to Hitachi, Ltd. Process of manufacturing a centrifugal angular advance device for an internal combustion engine. 4,183,131, Cl. 29-434.000.
Seyb, Edgar J., Jr.: *See*—
Chessin, Hyman; and Seyb, Edgar J., Jr., 4,183,789, Cl. 204-43.00T.
Sezaki, Eiji: *See*—
Ueno, Hiroshi; Sezaki, Eiji; Inaba, Naomi; Makishima, Tokuo; Watanabe, Koh; and Wada, Shozo, 4,183,826, Cl. 252-429.00B.
Shabram, Lyle F., Jr. Variable chord-forming capo. 4,183,279, Cl. 84-318.000.
Sharp Kabushiki Kaisha: *See*—
Funada, Fumiaki; Toda, Kiyoshi; Matsuura, Masataka; and Wada, Tomio, 4,183,630, Cl. 350-334.000.
Sharpoint, Inc.: *See*—
Schmidt, Rolf D.; and Theodore, Earl M., 4,183,431, Cl. 206-63.300.
Shaw, John B. Positive displacement gas expansion engine with low temperature differential. 4,183,220, Cl. 60-682.000.
Shea, Philip J.: *See*—
Gieske, Thomas H.; and Shea, Philip J., 4,183,939, Cl. 424-258.000.
Sheehan, Gerard M.: *See*—
Knapp, Donald E.; and Sheehan, Gerard M., 4,183,768, Cl. 106-299.000.
Shell Oil Company: *See*—
Breuker, Jacobus H.; de Haan, Hubertus N. H.; and Kwant, Pieter B., 4,183,801, Cl. 208-59.000.
Kollmeyer, Willy D., 4,183,857, Cl. 260-326.50B.
Patterson, Maurice M.; and Srinivasan, Krishnaswamy, 4,183,243, Cl. 73-155.000.
Shenderovich, Pavel B.: *See*—
Vulis, Mikhail L.; Rybin, Igor V.; Shenderovich, Pavel B.; Golenchenko, Valery A.; Shevchenko, Igor S.; and Schedrin, Vladimir G., 4,184,042, Cl. 174-15.00S.
Shepard, Inella G.: *See*—
Graham, William H.; and Shepard, Inella G., 4,184,031, Cl. 528-55.000.
Shepard, John S. Brackets for constructing temporary or moveable shelving. 4,183,488, Cl. 248-247.000.
Sheraton, Ronald F.; and Tumber, Brian W., to Lucas Industries Limited. Fluid control valves. 4,183,467, Cl. 239-73.000.
Sherwood, Willam G.; and Queneau, Paul B., to Amax Inc. Method and cell for electrolytic oxidation of $Ni(OH)_2$ with stationary bed electrode. 4,183,792, Cl. 204-96.000.
Shevchenko, Igor S.: *See*—
Vulis, Mikhail L.; Rybin, Igor V.; Shenderovich, Pavel B.; Golenchenko, Valery A.; Shevchenko, Igor S.; and Schedrin, Vladimir G., 4,184,042, Cl. 174-15.00S.
Shibata, Hiroshi: *See*—
Yamaguchi, Katsuhiko; Suzuki, Yasuhiro; Komima, Makoto; and Shibata, Hiroshi, 4,183,835, Cl. 260-29.2TN.
Shibata, Shin-ichi; Sato, Yasuji; Sano, Yoshikazu; and Yamamoto, Takao, to Tokyo Shibaura Electric Co., Ltd. Key telephone system. 4,184,054, Cl. 179-99.00M.
Shibaura Engineering Works Co. Ltd.: *See*—
Tamai, Tadashi; and Kojima, Takashi, 4,183,414, Cl. 173-118.000.
Shibuya, Kouichi: *See*—
Ono, Seibei; Shibuya, Kouichi; and Marikawa, Hiroshi, 4,183,842, Cl. 260-40.00P.
Shiga, Akinobu; Fukui, Yoshiharu; Matsumura, Kazuhiro; Sasaki, Toshio; and Okawa, Masahisa, to Sumitomo Chemical Company, Limited. Catalysts for the polymerization of olefins. 4,183,824, Cl. 252-429.00B.
Shikuma, Masao: *See*—
Kawasoko, Yoshiaki; Chiba, Iwane; Yamazaki, Noboru; Chiyonobu, Toshimi; and Shikuma, Masao, 4,183,773, Cl. 148-16.000.
Shiley Incorporated: *See*—
Curtis, Robert M., 4,183,961, Cl. 424-366.000.
Shimano Industrial Company Limited: *See*—
Segawa, Takashi, 4,183,262, Cl. 74-594.200.
Shiomura, Tetsunosuke; Ooka, Tatuo; Kobayashi, Takashi; Hagiwara, Kazuo; and Sadotomo, Hideo, to Mitsui Toatsu Chemicals, Incorpo-

rated. Method for recovering atactic polypropylene. 4,184,036, Cl. 528-499.000.

Shionogi & Co., Ltd.: *See—*
Makisumi, Yasuo; Sasatani, Takashi; and Murabayashi, Akira, 4,183,856, Cl. 548-246.000.
Yoshioka, Mitsuru; Uyeo, Shoichiro; Tsuji, Teruji; Hamashima, Yoshio; Kikkawa, Ikuo; and Nagata, Wataru, 4,183,855, Cl. 260-307.00F.

Shirane, Hideto: *See—*
Ohmura, Hiroshi; and Shirane, Hideto, 4,183,645, Cl. 354-106.000.

Shishido, Yasuhisa: *See—*
Tamura, Yorikazu; and Shishido, Yasuhisa, 4,183,837, Cl. 260-31.80F.

Shofu, Koichi. Self-energized portable high density light display unit. 4,184,194, Cl. 362-97.000.

Shouse, John F., Jr., to General Electric Company. Scan compensation circuit for a television receiver. 4,184,104, Cl. 315-371.000.

Shrewsburg, James E.: *See—*
Balko, Edward N.; Argade, Shyam D.; and Shrewsburg, James E., 4,183,793, Cl. 204-98.000.

Shrier, Adam L.: *See—*
Asher, William J.; Li, Norman N.; and Shrier, Adam L., 4,183,918, Cl. 424-94.000.

Shroot, Braham: *See—*
Baxter, Charles A. R.; and Shroot, Braham, 4,183,925, Cl. 424-246.000.

Shultz, Fred T.; and Lockwood, George S., to Monterey Abalone Farms. Abalone mariculture. 4,183,322, Cl. 119-4.000.

Sibbett, Donald J.: *See—*
Allen, Richard T.; Moyer, Rudolph H.; Sibbett, Donald J.; Anderson, Howard H.; Martner, Glen R.; and Willis, Don, 4,183,247, Cl. 73-421.50R.

Sibley, Alfred E.; Winsor, Travis W.; and Kinghorn, George F., to Cardiodyne, Inc. Ambulatory electrocardiographic recorder. 4,183,354, Cl. 128-711.000.

Sidders, Jerry F., to Dare Pafco, Inc. Vacuum metallizing process. 4,183,975, Cl. 427-50.000.

Siegenia-Frank Kg.: *See—*
Kucharczyk, Eckhard, 4,183,290, Cl. 98-37.000.

Siemens Aktiengesellschaft: *See—*
Bardahl, Nils; and Kliesch, Gunter, 4,184,199, Cl. 363-141.000.
Ebersberger, Otto, 4,184,075, Cl. 250-402.000.
Glaubitz, Werner, 4,184,153, Cl. 340-765.000.
Turini, Gerhard; and v. Tluck, Wolfgang, 4,184,107, Cl. 318-467.000.

Silverman, Paul: *See—*
Bartuska, William R.; and Silverman, Paul, 4,183,366, Cl. 132-7.000.

Silvertson Jr., Wiford E., to United States of America, National Aeronautics and Space Administration. Radar target for remotely sensing hydrological phenomena. 4,184,155, Cl. 343-5.0CM.

Simard, Houston H., to U.S. Industries, Inc. Cabinet door construction. 4,183,187, Cl. 52-475.000.

Simmons, Joseph H.: *See—*
Macedo, Pedro B.; Samanta, Mrinmay; and Simmons, Joseph H., 4,183,620, Cl. 350-96.300.

Simoons, John R. A.: *See—*
Wyburn-Mason, Roger, 4,183,941, Cl. 424-273.00R.

Simpson, Anthony; Peterkin, Stuart M.; Brooksby, Brian T.; and Murray, Harold J. Control apparatus for controlling a motion picture target apparatus. 4,183,534, Cl. 273-105.100.

Singer Company, The: *See—*
Johnson, Ralph E., 4,183,310, Cl. 112-184.000.
Knowles, Warren D., 4,183,311, Cl. 112-235.000.
Mey, Robert L.; Cowdrey, Roy M.; and Lenhart, John A., 4,183,594, Cl. 312-27.000.
Odermann, Charles R.; and Herron, William L., 4,183,313, Cl. 112-302.000.
Peterson, Wesley R., 4,183,593, Cl. 312-21.000.
Sato, Shuichi, 4,183,314, Cl. 112-316.000.

Skaalen, Clifford I., to United States of America, Navy. Hydraulic chain jack automatic latch control system. 4,183,502, Cl. 254-110.000.

Skarvada, Thomas, to Crane Co. Wheel speed sensing system. 4,184,203, Cl. 364-426.000.

Skelton, Merle D., to Magnavox Company, The. Vertical deflection drive circuit. 4,184,105, Cl. 315-397.000.

SKF Industrial Trading and Development Company B.V.: *See—*
Johansson, Carl E., 4,183,229, Cl. 64-14.000.

Skiera, Heinz, to VEB Polygraph Leipzig Kombinat fur Polygraphische Maschinen und Ausrustungen. Rotary assembly for two-sided offset printing. 4,183,297, Cl. 101-218.000.

Skov, Ebbe R.; Judge, Roderick B.; and Hemphill, Geoffrey, to W. R. Grace & Co. Aqueous ammonium isobutyrate-isobutyric acid solution useful for preserving seeds, silage, and other feedstuff. 4,183,953, Cl. 424-317.000.

Slagg, James E.: *See—*
Frey, Sydney W., Jr.; and Slagg, James E., 4,184,140, Cl. 338-174.000.

Slata, William P.: *See—*
Watkins, Bruce J.; Regan, A. Michael; and Slata, William P., 4,183,562, Cl. 285-405.000.

Slavin, Michael: *See—*
Rea, Irvin B.; and Slavin, Michael, 4,183,278, Cl. 84-1.240.

Slawson, Richard S., to G. W. Dahl Company, Inc. Thermal valve. 4,183,371, Cl. 137-75.000.

Sligter, Harm, to Lely Pacific. V-rake. 4,183,198, Cl. 56-377.000.

Smagala-Romanoff, Edward A., to ID Code Industries, Inc. Identification devices and systems. 4,184,148, Cl. 340-149.00A.

Smaw, Jesse B., to Marcal Paper Mills, Inc. Method and apparatus for counting straws and the like. 4,183,192, Cl. 53-444.000.

Smiley, Leonard H.; and Tigelaar, Howard L., to Rohm and Haas Company. Process for preparing highly filled acrylic articles. 4,183,991, Cl. 428-220.000.

Smith, Frank P., 2nd, to Narco Scientific, Inc. Identification tone reconstitution in a time shared navigational receiver. 4,184,157, Cl. 343-108.00R.

Smith, Frank P., 2nd, to Narco Scientific, Inc. Time shared operation of navigational unit. 4,184,158, Cl. 343-108.00R.

Smith, Joseph O. Fireplace front. 4,183,348, Cl. 126-140.000.

Smith, Stanley N.: *See—*
Corsi, George L.; and Smith, Stanley N., 4,183,892, Cl. 264-263.000.

Smith, Terence: *See—*
Owen, Howard D.; and Smith, Terence, 4,183,586, Cl. 299-43.000.

Smith, Wanda J.: *See—*
Mickle, James B., deceased; Smith, Wanda J.; and Dieken, Laurel M., 4,183,966, Cl. 426-42.000.

Smithies, Barry; and Straw, Alan, to Colgate-Palmolive Company. Antiperspirant compositions. 4,183,911, Cl. 424-36.000.

Smiths Industries Limited: *See—*
Rush, Derek A., 4,183,615, Cl. 350-96.210.
Rush, Derek A.; and Thornton, Anthony J., 4,183,618, Cl. 350-96.180.

Snell, John B., to Minnesota Mining and Manufacturing Company. Welding backup employing a train of knuckle-joint tiles. 4,183,454, Cl. 228-50.000.

Snell, Leonard S., to Rolls-Royce Limited. Gas turbine engine powerplants. 4,183,210, Cl. 60-204.000.

Snyder, Robert C., to Motor Wheel Corporation. Skid control system and method for automotive vehicles. 4,183,588, Cl. 303-110.000.

Sobel, Alan: *See—*
Meyer, Ralph L.; and Sobel, Alan, 4,183,125, Cl. 29-25.150.

Societe Anonyme de Telecommunications: *See—*
Allemandou, Philippe M. A.; and Beaudet, Didier M. C., 4,184,132, Cl. 333-198.000.
Jozwiak, Joseph E., 4,183,482, Cl. 244-3.160.

S.A. des Cableries et Trefileries de Cossonay: *See—*
Benoit, Pierre-Alain; and Widmer, Gilbert, 4,183,616, Cl. 350-96.200.

Societe Anonyme Francaise du Ferodo: *See—*
Poirier d'Ange d'Orsay, Emmanuel J.; and Paradis, Rene H., 4,183,397, Cl. 165-14.000.

Societe Colmant Cuvelier Dodge: *See—*
Bonnel, Michel G., 4,183,702, Cl. 406-56.000.

Societe d'Assistance Technique Pour Produits Nestle S.A.: *See—*
Brimelow, Christopher J. B.; and Brittain, John E., 4,183,963, Cl. 426-321.000.

Societe d'Etudes de Produits Chimiques: *See—*
Esanu, Andre, 4,183,926, Cl. 424-247.000.

Societe d'Exploitation des Cables Electriques: *See—*
Benoit, Pierre-Alain; and Widmer, Gilbert, 4,183,616, Cl. 350-96.200.

Societe Nationale d'Etude et de Construction de Moteurs d'Aviation: *See—*
Menioux, Claude C. F., 4,183,211, Cl. 60-224.000.

Societe Nationale Industrielle Aero-Spatiale: *See—*
Banos, Jean; Cantagrel, Jean-Claude; Cahuzac, Georges; and Darrieux, Jean-Louis, 4,183,232, Cl. 66-11.000.

Societe Nouvelle des Appareils de Precision et Compteurs: *See—*
Testemale, Jean, 4,183,251, Cl. 74-54.000.

Societe pour l'Equipement de Vehicules: *See—*
Poirier d'Ange d'Orsay, Emmanuel J.; and Paradis, Rene H., 4,183,397, Cl. 165-14.000.

Soda, Atsuhiko: *See—*
Yabe, Kenji; Soda, Atsuhiko; Minami, Satoyuki; and Iida, Osamu, 4,183,749, Cl. 430-211.000.

Soky Giken Kogyo Kabushiki Kaisha: *See—*
Kitazawa, Noboru, 4,183,181, Cl. 51-75.000.

Solar Chemical Corporation: *See—*
Biletch, Harry A.; Route, Rodney; and Zomlefer, Jack, 4,183,878, Cl. 525-86.000.

Soldati, Gianluigi; Schlichting, David A.; and Finkelstein, Paul. Benzothiadiazine 1, 1-dioxides. 4,184,039, Cl. 544-12.000.

Solomon, Daniel M.: *See—*
Gold, Elijah H.; and Solomon, Daniel M., 4,183,923, Cl. 424-241.000.

Sommer, Gordon M., to G. M. Sommer Company, Inc. Clutch-brake with speed differential coolant pump. 4,183,425, Cl. 192-113.00B.

Sonoda, Tomiya: *See—*
Washida, Hiroshi; and Sonoda, Tomiya, 4,184,077, Cl. 250-483.000.

Sony Corporation: *See—*
Sahara, Hiroshi; Tanaka, Yutaka; and Isobe, Toshinobu, 4,184,176, Cl. 358-184.000.
Suzuki, Tadao, 4,184,187, Cl. 361-90.000.
Tamaru, Hideshi, 4,184,173, Cl. 358-10.000.

Sordello, Frank J.; and Touchton, James J., to Sperry Rand Corporation. Self-regulating electronic tachometer. 4,184,108, Cl. 318-618.000.

Sossin, Mark W. Ancillary valve rocker means. 4,183,252, Cl. 74-55.000.

Sous-marins et du Radio: *See—*
Alcaide, Andre, 4,184,048, Cl. 179-1.0CN.

Southern California Edison Company: *See*—
Rolfe, Richard B., 4,183,908, Cl. 423-555.000.
Spangler, Walter W., Jr.: *See*—
Evans, James M.; and Spangler, Walter W., Jr., 4,183,834, Cl. 260-27.0BB.
Spellman, Gordon B.: *See*—
Jaskolski, Stanley V.; Lade, Robert W.; Schutten, Herman P.; and Spellman, Gordon B., 4,184,126, Cl. 331-66.000.
Spencer, Hugh J. Pressure-isolating circulating pump for solar water heating. 4,183,352, Cl. 126-432.000.
Sperry Rand Corporation: *See*—
Kemmetmueller, Gary H., 4,183,463, Cl. 235-312.000.
Melberg, Robert A.; and Wagner, Richard J., 4,184,201, Cl. 364-200.000.
Sordello, Frank J.; and Touchton, James J., 4,184,108, Cl. 318-618.000.
Wagner, Richard J.; and Melberg, Robert A., 4,184,200, Cl. 364-200.000.
Spiegelberg, William D.; and Moracz, Donald J., to TRW Inc. Method of isothermal forging. 4,183,236, Cl. 72-42.000.
Spisak, Edward G. Wheel and hubcap assembly. 4,183,587, Cl. 301-108.00R.
Spitz, Albert W.; and Schwab, Milton I., to Milpat Corporation. Pollution controlled incineration system. 4,183,307, Cl. 110-235.000.
Sprague Electric Company: *See*—
Schroeder, Walter W., 4,183,600, Cl. 339-218.00R.
Srinivasan, Krishnaswamy: *See*—
Patterson, Maurice M.; and Srinivasan, Krishnaswamy, 4,183,243, Cl. 73-155.000.
Stabilus GmbH: *See*—
Wirges, Winfried; and Sentinger, Egon, 4,183,689, Cl. 403-31.000.
Stacchiotti, Giuseppe; and Bellucci, Arturo, to Telettra Laboratori de Telafonia Elettronica E Radio S.p.A. Quartz crystal resonator with supplemental electrodes for controlling the Q factor. 4,184,095, Cl. 310-366.000.
Stafford, Donald C.; and Andrepont, John S., to Chicago Bridge & Iron Company. Piggable fluid swivel. 4,183,559, Cl. 285-190.000.
Stafford, Joseph D., to Texaco Inc. Seismic signal conductor testing system. 4,184,143, Cl. 367-13.000.
Stahl, Edward L.: *See*—
Sanders, Ellsworth E.; and Stahl, Edward L., 4,183,491, Cl. 248-346.000.
Stahlecker, Fritz, to Stahlecker, Fritz; and Stahlecker, Hans. Open-end spinning machine with means for catching and removing separated debris. 4,183,201, Cl. 57-301.000.
Stahlecker, Hans: *See*—
Stahlecker, Fritz, 4,183,201, Cl. 57-301.000.
Stamicarbon, B.V.: *See*—
Baenens, Victor E. A.; and Thissen, Jan A. L., 4,183,810, Cl. 210-11.000.
Klapwijk, Abraham; and Lettinga, Gatze, 4,183,809, Cl. 210-8.000.
Stamm, Russell D.: *See*—
Monath, Robert; and Stamm, Russell D., 4,183,250, Cl. 74-10.330.
Stanadyne, Inc.: *See*—
Moen, Alfred M., 4,183,376, Cl. 137-625.170.
Stanifer, Charles D.: *See*—
Fletcher, Aaron N.; Stanifer, Charles D.; and Bliss, Dan E., 4,184,018, Cl. 429-199.000.
Starwin Industries, Inc.: *See*—
Staub, Anthony F.; Staub, Norman T.; and Erwin, John R., 4,183,776, Cl. 156-156.000.
Staub, Anthony F.; Staub, Norman T.; and Erwin, John R., to Starwin Industries, Inc. Tennis racket manufacture. 4,183,776, Cl. 156-156.000.
Staub, Norman T.: *See*—
Staub, Anthony F.; Staub, Norman T.; and Erwin, John R., 4,183,776, Cl. 156-156.000.
Staudacher, Werner. Prefabricated outer wall element. 4,183,350, Cl. 126-430.000.
Steel Heddle Manufacturing Company: *See*—
Kaufmann, Frank H., 4,183,380, Cl. 139-98.000.
Steelcase Inc.: *See*—
Karrip, Alexander A.; Wisniewski, Joseph M.; and Pergler, Charles C., 4,183,581, Cl. 297-306.000.
Stein, Michael A., to Universal Manufacturing Corporation. Gas discharge lamp ballast with equally spaced windings. 4,184,103, Cl. 315-276.000.
Steiner, Edwin C., to Dow Chemical Company, The. Polycyclic polyoxyalkylene compounds. 4,183,862, Cl. 260-340.700.
Steinhart, Horst K., to Rima Enterprises. Compensating stacker for printed signatures. 4,183,704, Cl. 414-31.000.
Stendel, Wilhelm: *See*—
Enders, Edgar; Stendel, Wilhelm; and Voege, Herbert, 4,183,913, Cl. 424-45.000.
Stenuick France: *See*—
Stenuick, Pierre, 4,183,415, Cl. 175-92.000.
Stenuick, Pierre, to Stenuick France. Drilling apparatus. 4,183,415, Cl. 175-92.000.
Stephan, Gerard, to Nadella, & French Body Corporate. Collapsible shaft assembly. 4,183,258, Cl. 74-492.000.
Sterrett, Charles C.; and Murphy, John H., to Westinghouse Electric Corp. Multiple plane spoke structure for a superconducting dynamoelectric machine. 4,184,089, Cl. 310-52.000.
Steshenko, Vladimir P.: *See*—
Rumyantsev, Leonid A.; Esenovsky-Lashkov, Jury K.; Lisevich, Anatoly A.; Kanevsky, Jury L.; Steshenko, Vladimir P.; Guba, Vladimir I.; Abramian, Vladimir A.; Tronin, Jury A.; Fedorov, Petr V.; Nazarov, Boris B.; and Mironenko, Mikhail A., 4,183,424, Cl. 192-3.580.
Stevens, William, to Scovill Manufacturing Company. Panic-proof lockset. 4,183,563, Cl. 292-34.000.
Stevenson, Robert L., to Havaco Incorporated. Rotary control valve for expansion fluid engines. 4,183,285, Cl. 91-180.000.
Stewart, John H.; and Dekkers, Leo P., to Dennison Manufacturing Company. Harnessing device with gripper rails. 4,183,119, Cl. 24-16.0PB.
Stofko, John, to Jansky, John. Bonding of solid lignocellulosic material. 4,183,997, Cl. 428-326.000.
Stolove, Solomon. Solution and method for cleaning, polishing and lubricating magnetic heads. 4,183,819, Cl. 252-144.000.
Stopper, Herbert: *See*—
Yuen, Raymond C.; Menezes, Mark A.; and Stopper, Herbert, 4,183,460, Cl. 235-302.000.
Storage Technology Corporation: *See*—
Clingenpeel, Glenn R., 4,184,051, Cl. 179-15.0AS.
Stork, Gilbert: *See*—
Mookherjee, Braja D.; Trenkle, Robert W.; Vock, Manfred H.; Luccarelli, Domenick, Jr.; Schmitt, Frederick L.; Stork, Gilbert; MacDonald, Timothy; and Liberman, Arthur L., 4,183,965, Cl. 426-548.000.
Stoy, Artur: *See*—
Wichterle, Otto; and Stoy, Artur, 4,183,884, Cl. 264-41.000.
Straw, Alan: *See*—
Smithies, Barry; and Straw, Alan, 4,183,911, Cl. 424-36.000.
Strazewski, Edward R. Battery refill indicator. 4,184,011, Cl. 429-91.000.
Streck, Roland; Zerpner, Dieter; Haag, Horst; and Nordsiek, Karl-Heinz, to Chemische Werke Huls Aktiengesellschaft. Polymeric adhesion promoters for vulcanizable mixtures of elastomers and mineral fillers. 4,183,844, Cl. 260-42.150.
Striebig, Ludwig. Mechanism for cutting panels to size. 4,183,272, Cl. 83-411.00R.
Stuart Electronics: *See*—
Vye, Melvin C., 4,184,165, Cl. 343-874.000.
Stubbings, James H., to Potomac Applied Mechanics, Inc. Two-piece fastener air hammer. 4,183,239, Cl. 72-391.000.
Sudo, Kyosuke; Hasunuma, Hisao; Yamaoka, Takahiro; and Sagae, Shigeru. Sealed rolling bearing. 4,183,592, Cl. 308-187.200.
Sudo, Sadayuki; and Sudo, Takenaga, to Nara Grinding Machinery Works, Ltd. Melt mixer. 4,183,674, Cl. 366-91.000.
Sudo, Takenaga: *See*—
Sudo, Sadayuki; and Sudo, Takenaga, 4,183,674, Cl. 366-91.000.
Sudou, Youichi, to Toyota Jidosha Kogyo Kabushiki Kaisha. Air bag holding means in an inflating type occupant restraint device. 4,183,550, Cl. 280-743.000.
Suga, Shigeru. Weather resistance and light fastness tester with cooled xenon lamp. 4,184,096, Cl. 313-17.000.
Sugita, Mitsuyuki: *See*—
Ikeno, Hitoshi; Sugita, Mitsuyuki; and Yanagi, Hirofumi, 4,183,126, Cl. 29-25.350.
Sukhov, Stanislav A.: *See*—
Piterskikh, Georgy P.; Sukhov, Stanislav A.; Rumyantsev, Ivan I.; Pavlovsky, Lev L.; and Frolikov, Ivan I., 4,183,145, Cl. 34-10.000.
Sullivan, Timothy D., to United States of America, Navy. Piezoelectric polymer rectangular flexural plate hydrophone. 4,184,093, Cl. 310-331.000.
Sulzer Brothers Limited: *See*—
Frey, Otto, 4,183,104, Cl. 3-1.910.
Sumitomo Chemical Company, Limited: *See*—
Shiga, Akinobu; Fukui, Yoshiharu; Matsumura, Kazuhiro; Sasaki, Toshio; and Okawa, Masahisa, 4,183,824, Cl. 252-429.00B.
Yamamoto, Michihiro; Koshiba, Masao; and Yamamoto, Hisao, 4,183,932, Cl. 424-251.000.
Sumitomo Metal Industries, Ltd.: *See*—
Hashimoto, Noboru; Senjo, Teizo; and Kobayashi, Makio, 4,183,902, Cl. 423-210.000.
Summers, James W.; and Kliner, George J., to B.F. Goodrich Company, The. Method of making weather resistant composites. 4,183,777, Cl. 156-243.000.
Sun, Joseph Z.: *See*—
Weinberg, Alan S.; and Sun, Joseph Z., 4,183,882, Cl. 264-22.000.
Sunden, Birgitta: *See*—
Sunden, Olof; and Sunden, Birgitta, 4,183,783, Cl. 162-166.000.
Sunden, Olof; and Sunden, Birgitta, to Sunden, Olof. Semisynthetic paper structure on a urea basis. 4,183,783, Cl. 162-166.000.
Sundmar, J. P. Goran: *See*—
Hultgren, K. Sten R.; and Sundmar, J. P. Goran, 4,183,281, Cl. 89-47.000.
Sundstrand Corporation: *See*—
Hansen, Lowell D.; and Huber, Melvin F., 4,183,723, Cl. 417-204.000.
Sunpower, Inc.: *See*—
Beale, William T.; Wood, James G.; and Gedeon, David R., 4,183,214, Cl. 60-520.000.
Suwa, Michiharu, to Bell & Howell Company. Focusing system. 4,183,639, Cl. 354-25.000.
Suzuki, Katsuhiro; and Kinoshita, Masaru, to Nippon Electric Glass Company, Limited; and Narumi China Corporation. Browning vessels which used together with microwave ovens. 4,184,061, Cl. 219-10.55E.

Suzuki, Masayoshi: *See*—
Sagawa, Akio; Suzuki, Masayoshi; and Ito, Tetsuo, 4,184,086, Cl. 307-252.00J.

Suzuki, Suzuo: *See*—
Nagaishi, Hatuo; and Suzuki, Suzuo, 4,183,339, Cl. 123-119.00E.

Suzuki, Tadao, to Sony Corporation. Unbalanced DC voltage detecting circuit. 4,184,187, Cl. 361-90.000.

Suzuki, Takeshi. Top rollers and method for manufacture thereof. 4,183,127, Cl. 29-116.00R.

Suzuki, Yasuhiro: *See*—
Yamaguchi, Katsuhiko; Suzuki, Yasuhiro; Komima, Makoto; and Shibata, Hiroshi, 4,183,835, Cl. 260-29.2TN.

Svenska Sio Maskin AB: *See*—
Kristiansen, Oddvar, 4,183,240, Cl. 73-15.00R.

Svoboda, Jan, to Vyzkumny ustav hutnictvi zeleza. Heat radiation reference source for photothermometry. 4,184,066, Cl. 219-354.000.

Swain, C. Daniel, to Comerco, Inc. Wall bracket. 4,183,487, Cl. 248-214.000.

Swanson, Donald F., to Whirlpool Corporation. Ice maker with thermostatic water control. 4,183,222, Cl. 62-71.000.

Swanson, Kenneth. Animal trap. 4,183,165, Cl. 43-88.000.

Swartz, Delbert D.; and Tamaya, Masayuki. Fluid metering valve. 4,183,499, Cl. 251-208.000.

Sweetheart Plastics, Inc.: *See*—
Davis, Paul, 4,183,446, Cl. 220-306.000.

Swingline, Inc.: *See*—
Barrett, Edward E.; Lensky, Albert; Olesen, Paul; Becker, Christian F.; Pinczewski, Morris; Febre, Wilfredo; and Hahn, Steven, 4,183,453, Cl. 227-131.000.

Swiss Aluminium Ltd.: *See*—
Setzer, William C.; Hardy, Ronald G.; and Winter, Joseph, 4,183,771, Cl. 148-2.000.

Sylvachem Corporation: *See*—
Evans, James M.; and Spangler, Walter W., Jr., 4,183,834, Cl. 260-27.0BB.

Szporny, Laszlo: *See*—
Noteisz, Ferenc; Bartok, Mihaly; Felfoldi, Karoly; Karpati, Egon; and Szporny, Laszlo, 4,184,040, Cl. 546-342.000.

Tadanier, John S.: *See*—
Kurath, Paul; Tadanier, John S.; and Martin, Jerry R., 4,183,920, Cl. 424-180.000.

Tahara, Yasuteru; Minami, Shunsuke; Oda, Masaharu; and Sera, Mikio, to Mitsubishi Rayon Company, Limited. Method of measuring light transmission losses of optical materials. 4,183,666, Cl. 356-73.100.

Taiani, Patrick M.; and Marzouk, El-Sayed M., to Nova Research Foundation Corporation. Rotary magnetic isolation coupling. 4,184,090, Cl. 310-104.000.

Taiyo Hatsujo Mfg. Co., Ltd.: *See*—
Hashimoto, Seiichi, 4,183,280, Cl. 85-8.800.

Takagi, Yasuo, to Nissan Motor Company, Limited. Secondary air control in vehicle exhaust purification system. 4,183,212, Cl. 60-274.000.

Takahara, Kitao; Nose, Hiroyuki; Sasaki, Makoto; and Sakata, Kimio, to Director of National Aerospace Laboratory of Science and Technology Agency, Toshio Kawasaki, The. Air-cooled turbine blade. 4,183,716, Cl. 416-96.00A.

Takahashi, Minoru; Ishii, Osamu; Naito, Masanori; Kusuhara, Yoshinobu; and Imahigshi, Naofumi, to Sekisui Kagaku Kogyo Kabushiki Kaisha. Poly(phenylene sulfide) resin coating composition. 4,183,840, Cl. 260-37.00R.

Takahashi, Sakari, to Nippon Electric Co., Ltd. Semiconductor memory device comprising a p-n junction in a polycrystalline semiconductor layer. 4,184,085, Cl. 307-238.000.

Takaki, Masaoki: *See*—
Hideshima, Keiji; Sasaki, Naoki; and Takaki, Masaoki, 4,183,462, Cl. 235-304.000.

Takanashi, Yukio; Kimura, Sakae; Kuse, Takashi; and Matsuki, Toshiharu, to Tokyo Shibaura Electric Co., Ltd. Indirectly-heated cathode device for electron tubes. 4,184,100, Cl. 313-337.000.

Takara Co., Ltd.: *See*—
Ogawa, Iwakichi, 4,183,173, Cl. 46-202.000.

Takasago Perfumery Co., Ltd.: *See*—
Toyoda, Takaaki; and Muraki, Shigeru, 4,183,831, Cl. 252-522.00R.

Takayama, Suguru: *See*—
Adachi, Shichiro; Takayama, Suguru; and Sato, Takuo, 4,183,829, Cl. 252-466.0PT.

Takeda Chemical Industries, Ltd.: *See*—
Aono, Tetsuya; and Kawano, Yasuhiko, 4,183,859, Cl. 549-72.000.

Takeuchi, Tohru, to Nissan Motor Company, Limited. Closed loop rotational speed control system for gas turbine engine electric generator. 4,184,083, Cl. 290-40.00C.

Taki, Kiyoji. Emergency passive restraint protective system for vehicle occupants. 4,183,582, Cl. 297-464.000.

Tamai, Tadashi; and Kojima, Takashi, to Shibaura Engineering Works Co. Ltd. Percussion tool and cartridge-type oil tank therefor. 4,183,414, Cl. 173-118.000.

Tamaru, Hideshi, to Sony Corporation. Color television receiving apparatus. 4,184,173, Cl. 358-10.000.

Tamaya, Masayuki: *See*—
Swartz, Delbert D.; and Tamaya, Masayuki, 4,183,499, Cl. 251-208.000.

Tamez, Daniel. Chamfer strip for concrete structures. 4,183,497, Cl. 249-205.000.

Tamura, Sadahiro: *See*—
Nishikawa, Toshio; Tamura, Sadahiro; Ishikawa, Youhei; and Ito, Yoji, 4,184,130, Cl. 333-206.000.

Tamura, Yorikazu; and Shishido, Yasuhisa, to Teijin Limited. Liquid coating composition containing vinyl fluoride-hexafluoropropylene resin. 4,183,837, Cl. 260-31.80F.

Tanahashi, Toshio; and Sakai, Yoshiharu, to Toyota Jidosha Kogyo Kabushiki Kaisha. Internal combustion engine and a method of operating an internal combustion engine. 4,183,343, Cl. 123-191.00S.

Tanaka, Akio, to Zenith Radio Corporation. Wide window tuning system. 4,184,121, Cl. 325-464.000.

Tanaka, Asami. Method of marking dental contact points. 4,183,139, Cl. 32-19.000.

Tanaka, Eizi; Ohashi, Michihiro; and Nishimatsu, Akira, to Nippon Soken, Inc. Supercharged internal combustion engine. 4,183,216, Cl. 60-611.000.

Tanaka, Kenzo; and Endo, Tetsuhiko, to Toray Industries, Inc. Yarn texturing apparatus. 4,183,123, Cl. 28-273.000.

Tanaka, Toshiro: *See*—
Minowa, Seigi; Tanaka, Toshiro; and Yasuda, Nozomi, 4,183,971, Cl. 426-607.000.

Tanaka, Yoshitake: *See*—
Nakayama, Kiyoshi; Araki, Kazumi; and Tanaka, Yoshitake, 4,183,786, Cl. 435-116.000.

Tanaka, Yutaka: *See*—
Sahara, Hiroshi; Tanaka, Yutaka; and Isobe, Toshinobu, 4,184,176, Cl. 358-184.000.

Tanno, Kazuo: *See*—
Yoshizawa, Kiyoshi; Nojiro, Kikuo; Mitsutomi, Katsuyoshi; Hashimoto, Hiroshi; Noguchi, Akira; and Tanno, Kazuo, 4,183,807, Cl. 210-2.000.

Tapecon, Inc.: *See*—
Good, David M., 4,183,254, Cl. 74-206.000.

Tauby, William C.: *See*—
Sclafani, Augustus S.; Kirschbaum, Nathan; and Tauby, William C., 4,183,479, Cl. 244-121.000.

Taucher, Kenneth F. Optical system for creating high-intensity solar light beam. 4,183,612, Cl. 350-27.000.

Tavs, Peter; Kniese, Wilhelm; and Nienburg, Hans, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Production of aldehydes and alcohols by the oxo method. 4,183,871, Cl. 260-604.0HF.

Taylor, Ronald, to Rohm and Haas Company. O,S-dialyl O,S-ureidophenyl phosphorothiolates and phosphorodithioates. 4,183,922, Cl. 424-211.000.

Taylor, Scot W.: *See*—
Davis, Earl K.; Hansen, Kent W.; Taylor, Scot W., and Wentworth, Robert M., 4,184,189, Cl. 361-283.000.

Taylor, Terrence F. E.; Bansal, Vishwa N.; and Raby, Peter T. C., to International Standard Electric Corporation. Ink-drop print-head. 4,184,169, Cl. 346-140.00R.

Taylor, Thomas E.: *See*—
Bryers, Richard W.; and Taylor, Thomas E., 4,183,330, Cl. 122-4.00D.

TDK Electronics Co. Ltd.: *See*—
Adachi, Shichiro; Takayama, Suguru; and Sato, Takuo, 4,183,829, Cl. 252-466.0PT.

Technar, Incorporated: *See*—
Bell, Lon E.; and Diller, Robert W., 4,184,136, Cl. 337-141.000.

Teijin Limited: *See*—
Tamura, Yorikazu; and Shishido, Yasuhisa, 4,183,837, Cl. 260-31.80F.

Telecommunications Radioelectriques et Telephoniques TRT: *See*—
Ferrieu, Gilbert M. M.; and Breant, Pierre L. V., 4,184,150, Cl. 340-347.0DD.

Telettra Laboratori de Telafonia Elettronica E Radio S.p.A.: *See*—
Stacchiotti, Giuseppe; and Bellucci, Arturo, 4,184,095, Cl. 310-366.000.

Teng, James: *See*—
Lucas, James M.; and Teng, James, 4,183,764, Cl. 106-178.000.

Terrain King Corporation: *See*—
James, Ronald N., 4,183,195, Cl. 56-11.900.

Terzian, Rouben T., to Marvin Glass & Associates. Changeable figure toy. 4,183,171, Cl. 46-119.000.

Teshima, Kiyomi; and Kajitani, Yukimasa, to Mitsui Engineering & Shipbuilding Co., Ltd.; and Nippon Steel Corporation. Protective device for turbine driven by exhaust gas from blast furnace. 4,183,506, Cl. 266-88.000.

Teshirogi, Toshihiko. Mixing circuit. 4,184,120, Cl. 325-436.000.

Testemale, Jean, to Societe Nouvelle des Appareils de Precision et Compteurs. Timer mechanism. 4,183,251, Cl. 74-54.000.

Texaco Development Corp.: *See*—
Cuscurida, Michael, 4,184,023, Cl. 521-129.000.
Klein, Howard P., 4,184,024, Cl. 521-167.000.

Texaco Inc.: *See*—
Brown, Winthrop K., 4,183,242, Cl. 73-136.00A.
Stafford, Joseph D., 4,184,143, Cl. 367-13.000.
Vartanian, Paul F.; and Biasotti, Joseph B., 4,183,732, Cl. 44-62.000.

Texas Instruments Incorporated: *See*—
McBride, Lyle E., Jr., 4,184,070, Cl. 250-227.000.
McElroy, David J., 4,184,207, Cl. 365-185.000.
Norris, Jerry L.; and Hartmann, Clinton S., 4,184,052, Cl. 179-15.00A.
Tubbs, Graham S., 4,184,208, Cl. 365-203.000.

Th. Goldschmidt AG: *See*—
Theile, Heinz; Hoffmann, Hermann; Rossmy, Gerd; Koerner, Gotz; and Zaske, Peter, 4,183,820, Cl. 252-342.000.

Thakker, Mahendra T.: *See*—
Carrock, Frederick E.; and Thakker, Mahendra T., 4,184,026, Cl. 525-4.000.

Theile, Heinz; Hoffmann, Hermann; Rossmy, Gerd; Koerner, Gotz; and Zaske, Peter, to Th. Goldschmidt AG. Use of demulsifying mixtures for breaking petroleum emulsions. 4,183,820, Cl. 252-342.000.

Theodore, Earl M.: *See—*
Schmidt, Rolf D.; and Theodore, Earl M., 4,183,431, Cl. 206-63.300.

Thermo King Corporation: *See—*
Mayer, Donald K., 4,183,591, Cl. 308-187.000.

Thien, Gerhard: *See—*
Kirchweger, Karl; Thien, Gerhard; and Fachbach, Heinz, 4,183,344, Cl. 123-198.00E.

Thiokol Corporation: *See—*
Graham, William H.; and Shepard, Inella G., 4,184,031, Cl. 528-55.000.

Thissen, Jan A. L.: *See—*
Baenens, Victor E. A.; and Thissen, Jan A. L., 4,183,810, Cl. 210-11.000.

Thomas, Robert E. Method of transmitting hydrogen. 4,183,369, Cl. 137-13.000.

Thompson, David L. Wet-dry vacuum sweeper. 4,183,116, Cl. 15-353.000.

Thompson, Kenneth P.; and Ihde, Richard C., to Champion International Corporation. Polymeric multiple-layer sheet material. 4,183,435, Cl. 206-557.000.

Thorne, George W. Encircling devices. 4,183,120, Cl. 24-16.00R.

Thornton, Anthony J.: *See—*
Rush, Derek A.; and Thornton, Anthony J., 4,183,618, Cl. 350-96.180.

Thousand, J. W., Jr.: *See—*
Gupta, Kedar P.; and Thousand, J. W., Jr., 4,184,135, Cl. 336-62.000.

Thrasher, Samuel R.: *See—*
French, James M.; and Thrasher, Samuel R., 4,183,539, Cl. 277-22.000.

Thyssen Industrie AG: *See—*
Oppenlander, Harry; and Naundorf, Peter, 4,183,701, Cl. 405-295.000.

Tiberi, Robert: *See—*
Green, Michael J.; and Tiberi, Robert, 4,183,924, Cl. 424-242.000.

Tibolla, Marcello: *See—*
Doria, Gianfederico; Romeo, Ciriaco; Lauria, Francesco; Corno, Maria L.; Giraldi, Piernicola; and Tibolla, Marcello, 4,183,945, Cl. 424-283.000.
Doria, Gianfederico; Romeo, Ciriaco; Lauria, Francesco; Corno, Maria L.; Giraldi, Piernicola; and Tibolla, Marcello, 4,183,946, Cl. 424-283.000.

Tigelaar, Howard L.: *See—*
Smiley, Leonard H.; and Tigelaar, Howard L., 4,183,991, Cl. 428-220.000.

Tignanelli, Gerald: *See—*
Greenly, Robert B.; Paz, George A.; and Tignanelli, Gerald, 4,183,663, Cl. 355-77.000.

Timex Corporation: *See—*
Blaetterlein, Matthias, 4,183,986, Cl. 428-160.000.

Timraleev, Rafail J.: *See—*
Petrovsky, Viktor A.; Gassanov, Lev G.; Belyaev, Sergei M.; Kochetov, Lev A.; Kryzhanovsky, Vitaly L.; Palamarchuk, Andrei A.; Timraleev, Rafail J.; Ushakov, Viktor D.; and Parfenjuk, Vitaly M., 4,184,156, Cl. 343-8.000.

Tisserand, Andre: *See—*
Meunier, Gerard; and Tisserand, Andre, 4,183,602, Cl. 339-45.00M.

Tjornhom, David A., Sr. Apparatus for mounting and removing electrical adapter from a socket. 4,183,604, Cl. 339-78.000.

Toa Nenryo Kogyo Kabushiki Kaisha: *See—*
Ueno, Hiroshi; Sezaki, Eiji; Inaba, Naomi; Makishima, Tokuo; Watanabe, Koh; and Wada, Shozo, 4,183,826, Cl. 252-429.00B.

Toda, Kiyoshi: *See—*
Funada, Fumiaki; Toda, Kiyoshi; Matsuura, Masataka; and Wada, Tomio, 4,183,630, Cl. 350-334.000.

Toho Zinc Co. Ltd.: *See—*
Yoshizawa, Kiyoshi; Nojiro, Kikuo; Mitsutomi, Katsuyoshi; Hashimoto, Hiroshi; Noguchi, Akira; and Tanno, Kazuo, 4,183,807, Cl. 210-2.000.

Tokico Ltd.: *See—*
Nagashima, Eiji; and Fukushima, Masanori, 4,183,132, Cl. 29-451.000.

Tokyo Metropolitan Government: *See—*
Hiratsuka, Shoichi; and Arai, Hideki, 4,183,683, Cl. 400-122.000.

Tokyo Shibaura Denki Kabushiki Kaisha: *See—*
Jinnai, Isao, 4,184,191, Cl. 361-336.000.

Tokyo Shibaura Electric Co., Ltd.: *See—*
Sato, Fumitaka, 4,183,461, Cl. 235-304.000.
Shibata, Shin-ichi; Sato, Yasuji; Sano, Yoshikazu; and Yamamoto, Takao, 4,184,054, Cl. 179-99.00M.
Takanashi, Yukio; Kimura, Sakae; Kuse, Takashi; and Matsuki, Toshiharu, 4,184,100, Cl. 313-337.000.
Washida, Hiroshi; and Sonoda, Tomiya, 4,184,077, Cl. 250-483.000.

Tomikawa, Hisao, to Tsubakimoto Chain Co. Conveyor load transfer apparatus. 4,183,427, Cl. 198-464.000.

Tooth, Alan J., to Portals Limited. Security papers. 4,183,989, Cl. 428-195.000.

Toray Industries, Inc.: *See—*
Tanaka, Kenzo; and Endo, Tetsuhiko, 4,183,123, Cl. 28-273.000.
Yabe, Kenji; Soda, Atsuhiko; Minami, Satoyuki; and Iida, Osamu, 4,183,749, Cl. 430-211.000.

Toshiba Photo Products Co., Ltd.: *See—*
Kuraishi, Kaoru, 4,183,647, Cl. 354-132.000.

Toth, Dennis A., to Foster Wheeler Development Corporation. Fluidized bed unit including an electrical air preheat apparatus. 4,183,308, Cl. 110-263.000.

Touchton, James J.: *See—*
Sordello, Frank J.; and Touchton, James J., 4,184,108, Cl. 318-618.000.

Towns, Edward J.: *See—*
Downing, Neil H.; Brown, Edward M.; and Towns, Edward J., 4,183,450, Cl. 222-455.000.

Toyo Kogyo Co., Ltd.: *See—*
Hayashi, Toshio, 4,183,575, Cl. 296-56.000.

Toyoda, Takaaki; and Muraki, Shigeru, to Takasago Perfumery Co., Ltd. 5-Ethyl-4-methyl-methylnicotinate perfume compositions. 4,183,831, Cl. 252-522.00R.

Toyota Jidosha Kogyo Kabushiki Kaisha: *See—*
Sudou, Youichi, 4,183,550, Cl. 280-743.000.
Tanahashi, Toshio; and Sakai, Yoshiharu, 4,183,343, Cl. 123-191.00S.
Tsubaki, Yosuke, 4,183,992, Cl. 428-245.000.
Tsubaki, Yosuke, 4,183,994, Cl. 428-253.000.
Ueda, Tatehito; Yamanaka, Minoru; and Ito, Shoji, 4,183,372, Cl. 137-81.000.

Travis, John C.: *See—*
Green, Robert B.; Keller, Richard A.; Luther, Gabriel G.; Schenk, Peter C.; and Travis, John C., 4,184,127, Cl. 331-94.50S.

Tree Top, Inc.: *See—*
Banks, Kenneth A., 4,183,292, Cl. 99-468.000.

Trendler Metal Products, Inc.: *See—*
Cleveland, Robert M., 4,183,494, Cl. 248-628.000.

Trenkle, Robert W.: *See—*
Mookherjee, Braja D.; Trenkle, Robert W.; Vock, Manfred H.; Luccarelli, Domenick, Jr.; Schmitt, Frederick L.; Stork, Gilbert; MacDonald, Timothy; and Liberman, Arthur L., 4,183,965, Cl. 426-548.000.

Tribolet, Jose M. N. S.: *See—*
Crochiere, Ronald E.; and Tribolet, Jose M. N. S., 4,184,049, Cl. 179-1.0SA.

Troncoso, Fernando V., Jr. Archery bow in combination with an adjustable draw check. 4,183,346, Cl. 124-24.00R.

Tronin, Jury A.: *See—*
Rumyantsev, Leonid A.; Esenovsky-Lashkov, Jury K.; Lisevich, Anatoly A.; Kanevsky, Jury L.; Steshenko, Vladimir P.; Guba, Vladimir I.; Abramian, Vladimir A.; Tronin, Jury A.; Fedorov, Petr V.; Nazarov, Boris B.; and Mironenko, Mikhail A., 4,183,424, Cl. 192-3.580.

TRW Inc.: *See—*
Key, Edward H., 4,183,610, Cl. 339-221.00R.
Spiegelberg, William D.; and Moracz, Donald J., 4,183,236, Cl. 72-42.000.

Tsubaki, Yosuke, to Toyota Jidosha Kogyo Kabushiki Kaisha. Vibration-absorbing heat-insulating plate. 4,183,992, Cl. 428-245.000.

Tsubaki, Yosuke, to Toyota Jidosha Kogyo Kabushiki Kaisha. Heat insulating plate. 4,183,994, Cl. 428-253.000.

Tsubakimoto Chain Co.: *See—*
Tomikawa, Hisao, 4,183,427, Cl. 198-464.000.

Tsuji, Osami: *See—*
Matsumoto, Nobuo; Tsuji, Osami; and Hamada, Shinji, 4,183,751, Cl. 430-258.000.

Tsuji, Teruji: *See—*
Yoshioka, Mitsuru; Uyeo, Shoichiro; Tsuji, Teruji; Hamashima, Yoshio; Kikkawa, Ikuo; and Nagata, Wataru, 4,183,855, Cl. 260-307.00F.

Tsukamoto, Haruo; Koide, Kazuo; Okazaki, Yuzo; and Yamada, Isao, to Oji Paper Co., Ltd. Process for simultaneously drying mechanical wood pulp and improving mechanical strength and brightness of the pulp. 4,183,146, Cl. 34-13.800.

Tsumura, Yoshishige. Demagging process for aluminum alloy without air pollution. 4,183,745, Cl. 75-68.00R.

Tsunashima, Teruyoshi, to Nippon Kogaku K. K. Wide-angle photographic objective. 4,183,625, Cl. 350-207.000.

Tsunefuji, Katsuhiko, to Olympus Optical Co., Ltd. Electrical shutter of electromagnetic release type for camera. 4,183,646, Cl. 354-106.000.

Tubbs, Graham S., to Texas Instruments Incorporated. Pseudo-static semiconductor memory cell. 4,184,208, Cl. 365-203.000.

Tumber, Brian W.: *See—*
Sheraton, Ronald F.; and Tumber, Brian W., 4,183,467, Cl. 239-73.000.

Turbowitz, Leslie: *See—*
Barris, George; and Turbowitz, Leslie, 4,183,174, Cl. 46-254.000.

Tureck, Albert; and Cox, Arthur, to Tureck, Albert. Photographic background device. 4,183,644, Cl. 354-77.000.

Turini, Gerhard; and v. Tluck, Wolfgang, to Siemens Aktiengesellschaft. Control circuit for a predetermined angular movement of a DC motor. 4,184,107, Cl. 318-467.000.

Turner, Gary B.: *See—*
United States of America, National Aeronautics and Space Administration; and Turner, Gary B., 4,184,111, Cl. 324-404.000.

Twelve Pocket Billiard-Pool, Inc.: *See—*
De Marco, John, Jr., 4,183,525, Cl. 273-12.000.

U.S.A. 161 Developments Ltd.: *See—*
Lindberg, John E., 4,183,338, Cl. 123-119.00A.

Uchida, Toshio; Yabuta, Yorimiti; Noguchi, Hiroshi; Hasegawa, Eiichi; and Ikeda, Teppei, to Fuji Photo Film Co., Ltd. Step tablet. 4,183,990, Cl. 428-212.000.
Ueda, Tatehito; Yamanaka, Minoru; and Ito, Shoji, to Aisin Seiki Kabushiki Kaisha; and Toyota Jidosha Kogyo Kabushiki Kaisha. Altitude compensation valve assembly. 4,183,372, Cl. 137-81.000.
Ueno, Hiroshi; Sezaki, Eiji; Inaba, Naomi; Makishima, Tokuo; Watanabe, Koh; and Wada, Shozo, to Toa Nenryo Kogyo Kabushiki Kaisha. Titanium trichloride catalyst and process for the production thereof. 4,183,826, Cl. 252-429.00B.
Ueyama, Takehiko; Nishizawa, Masahiro; Yamazaki, Eiichi; and Ogura, Iwao, to Hitachi, Ltd. Method and apparatus for forming phosphor screen of color picture tubes. 4,183,637, Cl. 354-1.000.
Ultra Centrifuge: *See—*
Vermaes, Paul I.; and Vink, Paul J., 4,184,198, Cl. 363-71.000.
Umahashi, Minoru; Yamazaki, Hideo; Hasebe, Mitsuo; and Yamashita, Tadashi, to Ricoh Company, Ltd. Cleaning means for image transfer unit in electrophotographic copying machines. 4,183,655, Cl. 355-3.0TR.
Underhill, Michael J.: *See—*
Clark, Michael A. G.; and Underhill, Michael J., 4,184,122, Cl. 328-133.000.
Union Carbide Corporation: *See—*
Coast, John B., 4,183,515, Cl. 270-83.000.
Cotter, Ray W., 4,183,402, Cl. 165-175.000.
Davis, James W., 4,183,772, Cl. 148-6.160.
Drnevich, Raymond F., 4,183,808, Cl. 210-5.000.
Fan, You-Ling; and Farnham, Alford G., 4,183,874, Cl. 525-100.000.
Higley, David P.; and Wolf, Philip F., 4,183,863, Cl. 260-343.000.
Pines, Arthur N.; Johnson, Gordon C.; and Campbell, Fannie L., 4,184,004, Cl. 428-413.000.
Ramachandran, Sundaresan, 4,183,814, Cl. 252-8.50C.
Urry, Lewis F., 4,184,007, Cl. 429-8.000.
Union Oil Company of California: *See—*
Lieffers, William C., 4,183,682, Cl. 366-339.000.
Uniroyal GmbH: *See—*
Grosch, Karl A., 4,183,389, Cl. 152-361.0FP.
Unit Rig & Equipment Co.: *See—*
Satterwhite, Charles R., 4,183,158, Cl. 37-190.000.
United Patents Trust Reg.-U.P.T.: *See—*
Rossollin, Jean-Claude M. M., 4,183,891, Cl. 264-154.000.
United States Gypsum Company: *See—*
Eby, Lawrence T.; and Nelsson, Nels, 4,183,987, Cl. 428-192.000.
U.S. Industries, Inc.: *See—*
Simard, Houston H., 4,183,187, Cl. 52-475.000.
United States of America
Air Force: *See—*
Brantley, James W., 4,183,720, Cl. 416-193.00A.
Mullally, James F., 4,184,125, Cl. 330-282.000.
Army: *See—*
Bosserman, David A., 4,184,069, Cl. 250-213.0VT.
Gilbert, Raine M., 4,184,073, Cl. 250-305.000.
Krupen, Philip, 4,183,303, Cl. 102-211.000.
Lindner, Herbert G., 4,184,117, Cl. 325-33.000.
Mellian, Sirvart A., 4,183,097, Cl. 2-2.500.
Weber, Arthur C., 4,183,215, Cl. 60-547.00R.
Commerce: *See—*
Green, Robert B.; Keller, Richard A.; Luther, Gabriel G.; Schenk, Peter C.; and Travis, John C., 4,184,127, Cl. 331-94.50S.
Energy: *See—*
Fischer, Albert K.; and Johnson, Carl E., 4,183,744, Cl. 75-20.00F.
Jacobson, Abram R., 4,183,671, Cl. 356-354.000.
Health, Education and Welfare: *See—*
Carlson, Walter; Wasserman, Donald; and Asburry, William, 4,183,360, Cl. 128-666.000.
Vollhardt, K. Peter C.; and Funk, Raymond L., 4,183,864, Cl. 260-397.300.
National Aeronautics and Space Administration; acting administrator; with respect to an invention of:
Turner, Gary B. Driver for solar cell I-V characteristic plots. 4,184,111, Cl. 324-404.000.
National Aeronautics and Space Administration; administrator; with respect to an invention of:
Sawko, Paul M.; Riccitiello, Salvatore R.; and Hamermesh, Charles L. Ambient cure polyimide foams prepared from aromatic polyisocyanates, aromatic polycarboxylic compounds, furfuryl alcohol, and a strong inorganic acid. 4,184,021, Cl. 521-106.000.
National Aeronautics and Space Administration: *See—*
Baker, Gerald J.; and Economu, Merle A., 4,184,149, Cl. 340-177.0VA.
Reese, Paul B.; and Murphy, David W., 4,183,217, Cl. 60-632.000.
Sandford, Maynard C.; and Gray, David L., 4,184,072, Cl. 250-231.0SE.
Silvertson Jr., Wiford E., 4,184,155, Cl. 343-5.0CM.
Navy: *See—*
Bennett, George J., 4,183,316, Cl. 114-331.000.
Burke, Richard J.; and Renholt, George, Jr., 4,183,301, Cl. 102-13.000.
Danowski, Rudolph J., 4,183,841, Cl. 260-38.000.
Fletcher, Aaron N.; Stanifer, Charles D.; and Bliss, Dan E., 4,184,018, Cl. 429-199.000.
Nagel, David J.; and Peckerar, Martin C., 4,184,078, Cl. 250-492.00A.
Skaalen, Clifford I., 4,183,502, Cl. 254-110.000.
Sullivan, Timothy D., 4,184,093, Cl. 310-331.000.
U.S. Philips Corporation: *See—*
Clark, Michael A. G.; and Underhill, Michael J., 4,184,122, Cl. 328-133.000.
Hildering, Willem C., 4,184,043, Cl. 174-68.500.
Richert, Raymond, 4,184,088, Cl. 310-17.000.
U.S. Phillips Corporation: *See—*
Camerik, Eduard, 4,183,627, Cl. 350-252.000.
United Technologies Corporation: *See—*
Bramwell, Frank, 4,183,687, Cl. 403-11.000.
Horgan, John J.; and Hamilton, Stuart, 4,183,208, Cl. 60-39.120.
Raber, Peter E.; and Gordon, Jason M., 4,183,672, Cl. 356-376.000.
Universal Manufacturing Corporation: *See—*
Stein, Michael A., 4,184,103, Cl. 315-276.000.
University Patents, Inc.: *See—*
Randolph, Alan D., 4,183,729, Cl. 23-230.00B.
UOP Inc.: *See—*
Adams, Frank H.; and Knapik, H. Peter G., 4,183,827, Cl. 252-439.000.
Antos, George J., 4,183,804, Cl. 208-139.000.
Antos, George J., 4,183,805, Cl. 208-139.000.
Upjohn Company, The: *See—*
Wiley, Paul F.; and Houser, David J., 4,183,860, Cl. 260-340.300.
Urani, Angelo: *See—*
Gaia, Aldino J.; and Urani, Angelo, 4,184,137, Cl. 337-161.000.
Urry, Lewis F., to Union Carbide Corporation. Nonaqueous battery construction. 4,184,007, Cl. 429-8.000.
Ushakov, Viktor D.: *See—*
Petrovsky, Viktor A.; Gassanov, Lev G.; Belyaev, Sergei M.; Kochetov, Lev A.; Kryzhanovsky, Vitaly L.; Palamarchuk, Andrei A.; Timraleev, Rafail J.; Ushakov, Viktor D.; and Parfenjuk, Vitaly M., 4,184,156, Cl. 343-8.000.
Uyeo, Shoichiro: *See—*
Yoshioka, Mitsuru; Uyeo, Shoichiro; Tsuji, Teruji; Hamashima, Yoshio; Kikkawa, Ikuo; and Nagata, Wataru, 4,183,855, Cl. 260-307.00F.
v. Tluck, Wolfgang: *See—*
Turini, Gerhard; and v. Tluck, Wolfgang, 4,184,107, Cl. 318-467.000.
Valmet Oy: *See—*
Koski, Erkki; and Koponen, Martti, 4,183,148, Cl. 34-23.000.
Van Cleave, George W.: *See—*
Ernst, Larry M.; Seigal, Steven D.; and Van Cleave, George W., 4,183,657, Cl. 355-14.00R.
van der Lely, Ary; and Bom, Cornelis J. G., to C. van der Lely N. V. Spreader. 4,183,468, Cl. 239-665.000.
van der Lely, Cornelis. Rotary harrows. 4,183,231, Cl. 64-28.00R.
van der Lely, Cornelis. Driving mechanisms and housings for such mechanisms. 4,183,286, Cl. 91-215.000.
van der Lely, Cornelis. Rotary harrows. 4,183,412, Cl. 172-59.000.
Vandervalk, Casey S., to Dennison Manufacturing Company. Ink jet collection system. 4,184,167, Cl. 346-75.000.
Van Dine, Max, to Vapolean Corporation, The. Fuel saving control system for internal combustion engines. 4,183,334, Cl. 123-119.0EC.
Van Melle, Leonard, to Industries - En Handelsonderneming Bijstede B.V. Locking element. 4,183,691, Cl. 403-109.000.
van Staveren, Hendricus C.: *See—*
Oosterling, Pieter A.; and van Staveren, Hendricus C., 4,183,196, Cl. 56-295.000.
Vapolean Corporation, The: *See—*
Van Dine, Max, 4,183,334, Cl. 123-119.0EC.
Varga, Laszlo: *See—*
Schon, Istvan; Kisfaludy, Lajos; Varro, Vince; Varga, Laszlo; and Nafradi, Jozsef, 4,183,909, Cl. 424-9.000.
Vargas, Eduardo A. Self starting hot gas engine with means for changing the expansion ratio. 4,183,219, Cl. 60-682.000.
Varian Associates, Inc.: *See—*
Anderson, Weston A., 4,183,249, Cl. 73-626.000.
Varro, Vince: *See—*
Schon, Istvan; Kisfaludy, Lajos; Varro, Vince; Varga, Laszlo; and Nafradi, Jozsef, 4,183,909, Cl. 424-9.000.
Vartanian, Paul F.; and Biasotti, Joseph B., to Texaco Inc. Use of quaternary ammonium salts of nitrogen containing polymers for improved carburetor detergency. 4,183,732, Cl. 44-62.000.
Vasishth, Ramesh C., to Cor Tech Research Ltd. Control of procedures for formation of water-immiscible thermosetting phenol-formaldehyde resins. 4,184,032, Cl. 528-139.000.
Vassiliou, Eustathios, to Du Pont de Nemours, E. I., and Company. Craze-resistant polysiloxane resin coatings and coating compositions containing a discontinuous phase. 4,183,998, Cl. 428-327.000.
VEB Polygraph Leipzig Kombinat fur Polygraphische Maschinen und Ausrustungen: *See—*
Skiera, Heinz, 4,183,297, Cl. 101-218.000.
Veeco Instruments Inc.: *See—*
Briglia, Donald D., 4,184,188, Cl. 361-234.000.
Vega, Mary-Louise: *See—*
Heffernan, William R.; Vega, Mary-Louise; and Gingras, Joel A., Sr., 4,184,193, Cl. 362-34.000.
Velsicol Chemical Corporation: *See—*
Goins, Otto K., 4,184,035, Cl. 528-274.000.
Vendramini, Dante M.: *See—*
Giovachini, Jean-Luc; Pascal, Jean-Pierre; and Vendramini, Dante M., 4,183,259, Cl. 74-572.000.

Vendramini, Dante Marc: *See*—
Giovachini, Jean-Luc; Pascal, Jean-Pierre; and Vendramini, Dante M., 4,183,259, Cl. 74-572.000.

Ventre, Edmond: *See*—
Blum, Jacques M.; and Ventre, Edmond, 4,183,785, Cl. 176-84.000.

Vermaes, Paul I.; and Vink, Paul J., to Ultra Centrifuge. Three-phase voltage generator responsive to DC control pulses. 4,184,198, Cl. 363-71.000.

Vick, Ralph L., to Bendix Corporation, The. Multi-path valve structure having extended life. 4,183,375, Cl. 137-625.300.

Vicon N.V.: *See*—
Oosterling, Pieter A.; and van Staveren, Hendricus C., 4,183,196, Cl. 56-295.000.

Victor Company of Japan, Ltd.: *See*—
Saito, Takashi, 4,183,538, Cl. 274-15.00R.

Vidal, Frederick D.; and Gerrity, Albert B., to Pennwalt Corporation. Potassium bromate composition. 4,183,972, Cl. 426-653.000.

Viennet, Rene: *See*—
Laesser, Claude; Viennet, Rene; and Saurer, Eric, 4,183,628, Cl. 350-338.000.

Viessmann, Klaus, to Kreidler Werke GmbH. Method and apparatus for horizontal continuous casting. 4,183,394, Cl. 164-66.000.

Vihos, George: *See*—
Brodersen, Hardy G., 4,183,160, Cl. 40-152.000.

Vink, Paul J.: *See*—
Vermaes, Paul I.; and Vink, Paul J., 4,184,198, Cl. 363-71.000.

Vinokur, Isaac. Process for manufacturing sausages. 4,183,964, Cl. 426-412.000.

Viro Innocenti S.p.A.: *See*—
Coralli, Giorgio V.; and Brunelli, Alessandro, 4,183,235, Cl. 70-34.000.

Vock, Manfred H.: *See*—
Mookherjee, Braja D.; Trenkle, Robert W.; Vock, Manfred H.; Luccarelli, Domenick, Jr.; Schmitt, Frederick L.; Stork, Gilbert; MacDonald, Timothy; and Liberman, Arthur L., 4,183,965, Cl. 426-548.000.

Vockenhuber, Karl: *See*—
Besenmatter, Walter; Kurz, Gunter; Metzler, Otto; and Muszumanski, Trude, 4,183,636, Cl. 353-101.000.

Voege, Herbert: *See*—
Enders, Edgar; Stendel, Wilhelm; and Voege, Herbert, 4,183,913, Cl. 424-45.000.

Vogler, Tina C.: *See*—
Asher, William J.; and Vogler, Tina C., 4,183,960, Cl. 424-365.000.

Volkswagenwerk Aktiengesellschaft: *See*—
Hofbauer, Peter; Heimermann, Wilhelm; Gummer, Dieter; and Willmann, Michael, 4,183,332, Cl. 123-52.00M.
Lohner, Ingolf, 4,183,342, Cl. 123-179.00L.

Vollhardt, K. Peter C.; and Funk, Raymond L., to United States of America, Health, Education and Welfare. Cobalt catalyzed steroid synthesis. 4,183,864, Cl. 260-397.300.

von Bose, Robert J.: *See*—
Keller, Cecil T.; and von Bose, Robert J., 4,183,189, Cl. 52-637.000.

von Klinggraff, Gerhard; Bohnes, Karlheinz; Kunzer, Heinz; and Marr, Peter, to Bochumer Eisenhutte Heintzmann GmbH. Walking mine support. 4,183,700, Cl. 405-291.000.

Vorontsov, Alexandr I.: *See*—
Khutoretsky, Garry M.; Vorontsov, Alexandr I.; and Ignatiev, Anatoly D., 4,184,091, Cl. 310-214.000.

Vulis, Mikhail L.; Rybin, Igor V.; Shenderovich, Pavel B.; Golenchenko, Valery A.; Shevchenko, Igor S.; and Schedrin, Vladimir G., to Gosudarstvenny Nauchno-Issledovatelsky Energeticheskiy Institut Imeni G.M. Krzhizhanovskogo. Multisection superconducting cable for carrying alternating current. 4,184,042, Cl. 174-15.00S.

Vye, Melvin C., to Stuart Electronics. Tuning system for tower antennas. 4,184,165, Cl. 343-874.000.

Vyzkumny ustav hutnictvi zeleza: *See*—
Svoboda, Jan, 4,184,066, Cl. 219-354.000.

W. R. Grace & Co.: *See*—
Coucher, Robert G.; and Gerek, Gene, 4,183,974, Cl. 427-28.000.
Skov, Ebbe R.; Judge, Roderick B.; and Hemphill, Geoffrey, 4,183,953, Cl. 424-317.000.
Weinberg, Alan S.; and Sun, Joseph Z., 4,183,882, Cl. 264-22.000.

Wacker-Chemie GmbH: *See*—
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Wada, Akemi: *See*—
Iwao, Shuji; Abe, Tetsuya; Yoshida, Tsutomu; and Wada, Akemi, 4,183,917, Cl. 424-70.000.

Wada, Shozo: *See*—
Ueno, Hiroshi; Sezaki, Eiji; Inaba, Naomi; Makishima, Tokuo; Watanabe, Koh; and Wada, Shozo, 4,183,826, Cl. 252-429.00B.

Wada, Tomio: *See*—
Funada, Fumiaki; Toda, Kiyoshi; Matsuura, Masataka; and Wada, Tomio, 4,183,630, Cl. 350-334.000.

Wagner, Paul-Heinz; Hirtsiefer, Karl-Richard; and Muller, Johann, to Paul-Heinz Wagner Maschinenfabrikation. Tool for rotating nuts, bolts and like fasteners. 4,183,260, Cl. 74-575.000.

Wagner, Richard J.; and Melberg, Robert A., to Sperry Rand Corporation. Integrating I/O element. 4,184,200, Cl. 364-200.000.

Wagner, Richard J.: *See*—
Melberg, Robert A.; and Wagner, Richard J., 4,184,201, Cl. 364-200.000.

Wagner, Wayne M., to Donaldson Company, Inc. U-bolt clamp assembly. 4,183,122, Cl. 24-277.000.

Wakabayashi, Hisao: *See*—
Nishimura, Katsuo; Wakabayashi, Hisao; Osaka, Takatoshi; Kume, Kazunari; Ogura, Yasuhiro; and Miya, Yukio, 4,183,629, Cl. 350-334.000.

Walch, Axel; and Lammers, Ludwig, to Hoechst Aktiengesellschaft. Membrane unit and device for cleansing blood. 4,183,811, Cl. 210-23.00R.

Walchle, David L.; and Pierson, Richard, to Xomed, Inc. Microscope drape and method of making same. 4,183,613, Cl. 350-65.000.

Walters, D. F., to Dresser Industries, Inc. Cutter actuated rock bit lubrication system. 4,183,416, Cl. 175-229.000.

Wanders, Marlene, heir: *See*—
Beckers, Hans; Jung, Paul-Werner; Bovians, Herbert; Heyer, Johann M., deceased; Heyer, Hans P., heir; and Wanders, Marlene, heir, 4,183,968, Cl. 426-512.000.

Wangard, William: *See*—
Kniepkamp, Alberto H.; and Wangard, William, 4,183,277, Cl. 84-1.030.

Ward, Leslie J. Demolition tool. 4,183,503, Cl. 254-131.000.

Ward, Terence J., to John Wyeth & Brother Limited. Blood pressure lowering benzoquinolizines. 4,183,937, Cl. 424-258.000.

Warner-Lambert Company: *See*—
Quick, Lloyd A., 4,183,770, Cl. 134-6.000.

Waschk, Fritz; Webersik, Heinz; Maurischat, Gunther; and Schott, Walter, to AGFA-Gevaert, A.G. Electrostatic copying machine utilizing flash discharge lamp for illuminating original and/or fixing toner image. 4,183,654, Cl. 355-3.0FU.

Washburn, Clyde, to Harris Corporation. Full binary programmed frequency divider. 4,184,068, Cl. 235-92.0CC.

Washida, Hiroshi; and Sonoda, Tomiya, to Tokyo Shibaura Electric Co., Ltd. Input screen of an image intensifier. 4,184,077, Cl. 250-483.000.

Wasserman, Donald: *See*—
Carlson, Walter; Wasserman, Donald; and Asburry, William, 4,183,360, Cl. 128-666.000.

Watakabe, Yuichi. Float type metal-air battery. 4,184,008, Cl. 429-27.000.

Watanabe, Koh: *See*—
Ueno, Hiroshi; Sezaki, Eiji; Inaba, Naomi; Makishima, Tokuo; Watanabe, Koh; and Wada, Shozo, 4,183,826, Cl. 252-429.00B.

Watkins, Bruce J.; Regan, A. Michael; and Slata, William P., to Regan Offshore International, Inc. Marine riser conduit section coupling means. 4,183,562, Cl. 285-405.000.

Watkins, Gordon L.: *See*—
Caton, Michael P. L.; Coffee, Edward C. J.; and Watkins, Gordon L., 4,183,870, Cl. 260-590.00C.

Watson, Richard W.; and Blakey, Philip G., to BOC Limited. Oxygen-enrichment columnar absorption process for making nitric acid. 4,183,906, Cl. 423-392.000.

Watt, William E. R., to Pharmachem Corporation. Peelable seal. 4,183,434, Cl. 206-438.000.

Weatherchem Corporation: *See*—
Loughley, William A.; and Otterson, Lewis L., 4,183,457, Cl. 229-5.500.

Weaver, Hardy P. Hand held seed sower. 4,183,469, Cl. 239-687.000.

Weber, Arthur C., to United States of America, Army. Pedal linkage hydraulic brake booster. 4,183,215, Cl. 60-547.00R.

Webersik, Heinz: *See*—
Waschk, Fritz; Webersik, Heinz; Maurischat, Gunther; and Schott, Walter, 4,183,654, Cl. 355-3.0FU.

Webster, David F. Apparatus and method for recording the walking ability of an individual. 4,183,552, Cl. 282-1.00B.

Weddigen, Gert; Fischer, Wilfried; Kleinschmager, Herbert; and Haar, Wilhelm, to Brown, Boveri & Cie AG. Electrochemical storage cell. 4,184,013, Cl. 429-104.000.

Weed Eater, Inc.: *See*—
Mitchell, Albert W.; and Woods, Donald M., 4,183,138, Cl. 30-276.000.

Weidemann, Dieter: *See*—
Klie, Wolfgang; Renner, Hermann; Weidemann, Dieter; and Weisshappel, Helmut, 4,183,574, Cl. 296-188.000.

Weiland, Emil: *See*—
Mautz, Karlheinz; Weiland, Emil; and Schwarz, Alois, 4,183,718, Cl. 416-134.00A.

Weinberg, Alan S.; and Sun, Joseph Z., to W. R. Grace & Co. Self-welding packaging film. 4,183,882, Cl. 264-22.000.

Weininger, Joseph L.: *See*—
Farrington, Gregory C.; and Weininger, Joseph L., 4,183,988, Cl. 429-193.000.

Weir, W. David; and Kilbourn, Edward E., to Rohm and Haas Company. Phosphonoureide and phosphonothioureide anthelmintics. 4,183,921, Cl. 424-200.000.

Weisshappel, Helmut: *See*—
Klie, Wolfgang; Renner, Hermann; Weidemann, Dieter; and Weisshappel, Helmut, 4,183,574, Cl. 296-188.000.

Welling, John R., to Motorola, Inc. Hermetic glass encapsulation for semiconductor die and method. 4,183,135, Cl. 29-588.000.

Wells, Paul W.: *See*—
Burch, John; and Wells, Paul W., 4,184,142, Cl. 367-112.000.

Wentworth, Robert M.: *See*—
Davis, Earl K.; Hansen, Kent W.; Taylor, Scot W.; and Wentworth, Robert M., 4,184,189, Cl. 361-283.000.

Wentworth, Robert S., Jr., to Borg-Warner Corporation. Mechanical seal assembly. 4,183,541, Cl. 277-88.000.

Werbetronic A.G.: *See*—
Santoro, Giovanni, 4,184,182, Cl. 360-96.600.

Werkzeugmaschinenfabrik Oerlikon-Buhrle AG: *See—*
Kotthaus, Erich, 4,183,182, Cl. 51-288.000.
Kotthaus, Erich, 4,183,703, Cl. 409-25.000.
West, Peter J.; and Parsons, John H., to Fisons Limited. Herbicidally-active heterocyclic compounds. 4,183,741, Cl. 71-92.000.
West, Roger A., to RWB Labs. Fast response electronic thermometer probe. 4,183,248, Cl. 73-362.0AR.
Western Electric Company, Incorporated: *See—*
Durr, Helmut E., 4,183,692, Cl. 403-275.000.
Western Publishing Company, Inc.: *See—*
Harris, John F., III, 4,183,152, Cl. 35-9.00C.
Westinghouse Electric Corp.: *See—*
Isaacs, Thelma J.; and Gottlieb, Milton, 4,183,617, Cl. 350-96.120.
Oehler, Harry G.; Herman, David S.; and Cricchi, James R., 4,183,134, Cl. 29-571.000.
Sterrett, Charles C.; and Murphy, John H., 4,184,089, Cl. 310-52.000.
Young, Robert G., 4,184,101, Cl. 313-485.000.
Wetzig, Lloyd M. Vehicle air and electrical connector. 4,183,599, Cl. 339-15.000.
Weyerhaeuser Company: *See—*
Rogers, Roy E., 4,183,315, Cl. 113-18.00R.
Whirlpool Corporation: *See—*
Swanson, Donald F., 4,183,222, Cl. 62-71.000.
Whitaker, Lawrence R., Jr.: *See—*
Hedin, Roland C.; and Whitaker, Lawrence R., Jr., 4,184,184, Cl. 360-133.000.
White, Allen W.: *See—*
Sellitto, Thomas A.; and White, Allen W., 4,183,799, Cl. 204-206.000.
White, Gerald D. Football game device. 4,183,531, Cl. 273-94.00R.
White Sea and Baltic Company Limited, The: *See—*
Epstein, David, 4,183,759, Cl. 106-38.200.
Wichterle, Otto; and Stoy, Artur, to Ceskoslovenska akademie ved. Method for manufacturing hydrogel tubes. 4,183,884, Cl. 264-41.000.
Widmer, Gilbert: *See—*
Benoit, Pierre-Alain; and Widmer, Gilbert, 4,183,616, Cl. 350-96.200.
Wiegand, Donald E.: *See—*
Browers, Scott D.; and Wiegand, Donald E., 4,183,984, Cl. 428-81.000.
Wiegard, Klaus: *See—*
Kinast, Karlheinz; and Wiegard, Klaus, 4,183,396, Cl. 165-9.000.
Wieser, Alfred, to Medtronic GmbH. Drive circuits for ultrasonic tooth treatment transducers. 4,184,092, Cl. 310-316.000.
Wilcox, Ernest J. Collapsible barricade. 4,183,695, Cl. 404-6.000.
Wiley, Paul F.; and Houser, David J., to Upjohn Company, The. Antibiotics 7(S)-0-alkylnogarols. 4,183,860, Cl. 260-340.300.
Wilkins, Cyril S.: *See—*
Griffin, Brian P.; Jukes, Alan W.; and Wilkins, Cyril S., 4,183,881, Cl. 264-13.000.
Wilkinson, Alvin H., to Auto Crane Company. Extensible boom. 4,183,440, Cl. 212-55.000.
Wilkinson, Samuel, to Burroughs Wellcome Co. Digoxin oxidized product. 4,184,037, Cl. 536-7.000.
Willcox, H. Keith: *See—*
McKenna, Charles M.; and Willcox, H. Keith, 4,183,780, Cl. 156-643.000.
William H. Rorer, Inc.: *See—*
Diamond, Julius; and Zalipsky, Jerome J., 4,183,956, Cl. 424-322.000.
Williams, Annie M., trustee: *See—*
Williams, James A., deceased; and Williams, Colin J., 4,183,294, Cl. 99-537.000.
Williams, Colin J.: *See—*
Williams, James A., deceased; and Williams, Colin J., 4,183,294, Cl. 99-537.000.
Williams, David E., to Amark Industries, Inc. Water heating means. 4,184,064, Cl. 219-303.000.
Williams, David W. Underwater communications device. 4,183,422, Cl. 181-173.000.
Williams, James A., deceased (by Williams, Annie M., trustee); and Williams, Colin J., to J.A. & A.M. Williams Pty. Ltd. Stone fruit cutter. 4,183,294, Cl. 99-537.000.
Williams, Thomas B.: *See—*
Norman, Vello; Moore, Henry; and Williams, Thomas B., 4,183,362, Cl. 131-9.000.
Willibald Grammer: *See—*
Meiller, Hermann, 4,183,492, Cl. 248-395.000.
Willis, Don: *See—*
Allen, Richard T.; Moyer, Rudolph H.; Sibbett, Donald J.; Anderson, Howard H.; Martner, Glen R.; and Willis, Don, 4,183,247, Cl. 73-421.50R.
Willmann, Michael: *See—*
Hofbauer, Peter; Heimermann, Wilhelm; Gummer, Dieter; and Willmann, Michael, 4,183,332, Cl. 123-52.00M.
Wills, Charlie R. Animal kick restrainer. 4,183,326, Cl. 119-96.000.
Windle, Denis: *See—*
Groszek, Aleksander J.; Parkes, Colin W.; and Windle, Denis, 4,183,757, Cl. 106-14.110.
Windmoller & Holscher: *See—*
Brockmuller, Friedrich-Franz; Feldkamper, Richard; and Meyer, Erwin, 4,183,518, Cl. 271-182.000.
Winiasz, Michael E.: *See—*
McGill, Robert W.; and Winiasz, Michael E., 4,183,428, Cl. 198-479.000.
Winn, B. Meredith, Jr., to Mobil Oil Corporation. Producing phosphorus oxyhalide. 4,183,905, Cl. 423-300.000.
Winsor, Travis W.: *See—*
Sibley, Alfred E.; Winsor, Travis W.; and Kinghorn, George F., 4,183,354, Cl. 128-711.000.
Winter, Hermann: *See—*
Kalka, Josef; and Winter, Hermann, 4,184,029, Cl. 526-216.000.
Winter, Joseph: *See—*
Setzer, William C.; Hardy, Ronald G.; and Winter, Joseph, 4,183,771, Cl. 148-2.000.
Winthaegen, Leon M. W., to Oce-van der Grinten N.V. Copying apparatus with imaging belt and image transfer via an intermediate support. 4,183,658, Cl. 355-3.0BE.
Wirges, Winfried; and Sentinger, Egon, to Stabilus GmbH. Column of telescopically adjustable length. 4,183,689, Cl. 403-31.000.
Wirz, Burkhardt: *See—*
Cappel, Bert; Mayer, Peter; Wirz, Burkhardt; and Decker, Peter, 4,183,298, Cl. 101-348.000.
Wise, James C.: *See—*
Hageman, Carlton V.; and Wise, James C., 4,183,517, Cl. 271-150.000.
Wisniewski, Joseph M.: *See—*
Karrip, Alexander A.; Wisniewski, Joseph M.; and Pergler, Charles C., 4,183,581, Cl. 297-306.000.
Wixon, Harold E.; and Schreiber, Ronald S., to Colgate-Palmolive Company. Laundry detergent compositions. 4,183,815, Cl. 252-8.800.
Wolatz, Fredrick E.: *See—*
Omilinsky, Barry A.; and Wolatz, Fredrick E., 4,183,763, Cl. 106-109.000.
Wolcott, Dana W.: *See—*
Harvey, Donald M.; and Wolcott, Dana W., 4,183,648, Cl. 354-135.000.
Wolf, Philip F.: *See—*
Higley, David P.; and Wolf, Philip F., 4,183,863, Cl. 260-343.000.
Wolfe, Harry W., Jr., to Du Pont de Nemours, E. I., and Company. Aqueous polyurethane dispersions. 4,183,836, Cl. 260-29.2TN.
Wolfe, James F.; and Rathman, Terry L., to Research Corporation. 2-Ketoalkyl-4(3H)-quinazolinones. 4,183,931, Cl. 424-251.000.
Wolfert, Peter K.: *See—*
Darby, Nicholas; and Wolfert, Peter K., 4,183,850, Cl. 260-239.100.
Womack, Leo K. Self-cleaning toilet. 4,183,105, Cl. 4-1.000.
Wood, Donald C.; and McLaughlin, Robert L., to DeSoto, Inc. Emollient-containing urea-based bath bead composition and the production thereof. 4,183,959, Cl. 424-358.000.
Wood, James G.: *See—*
Beale, William T.; Wood, James G.; and Gedeon, David R., 4,183,214, Cl. 60-520.000.
Woodland, James H. R.: *See—*
Brown, Michael J.; Resnick, Bruce M.; and Woodland, James H. R., 4,183,958, Cl. 424-326.000.
Woods, Donald M.: *See—*
Mitchell, Albert W.; and Woods, Donald M., 4,183,138, Cl. 30-276.000.
Woodward, Fred E. Paper coating composition. 4,183,766, Cl. 106-213.000.
Woodward, Oakley M., to RCA Corporation. Broad band, four loop antenna. 4,184,163, Cl. 343-742.000.
Woog, Philippe G. E.: *See—*
Moret, Michel A.; and Woog, Philippe G. E., 4,184,196, Cl. 433-29.000.
Worschech, Kurt: *See—*
Eckelt, Michael; Heyden, Rudi; Jaeckel, Manfred; Petzold, Manfred; and Worschech, Kurt, 4,183,875, Cl. 525-6.000.
Wu, E-Ming: *See—*
Chapman, Derek D.; and Wu, E-Ming, 4,183,755, Cl. 430-213.000.
Wyburn-Mason, Roger, to Simoons, John R. A. Treatment of rheumatoid arthritis and related diseases. 4,183,941, Cl. 424-273.00R.
Wyss, Walter, to H. Heer & Co. Arrangement for making a spigot-and-socket joint secure from sliding. 4,183,560, Cl. 285-232.000.
Xerox Corporation: *See—*
Burnham, Robert D.; Scifres, Donald R.; and Rawson, Eric G., 4,184,170, Cl. 357-17.000.
Sato, Masamichi; and Miyazuka, Hajime, 4,183,818, Cl. 430-115.000.
Xomed, Inc.: *See—*
Walchle, David L.; and Pierson, Richard, 4,183,613, Cl. 350-65.000.
Yabe, Kenji; Soda, Atsuhiko; Minami, Satoyuki; and Iida, Osamu, to Fuji Photo Film Co., Ltd.; and Toray Industries Inc. Photographic film with polyethylene terephthalate-polyalkylene glycol copolymer support. 4,183,749, Cl. 430-211.000.
Yabuta, Yorimiti: *See—*
Uchida, Toshio; Yabuta, Yorimiti; Noguchi, Hiroshi; Hasegawa, Eiichi; and Ikeda, Teppei, 4,183,990, Cl. 428-212.000.
Yagi, Yoshikazu, to Nippondenso Co., Ltd. Centrifugal governor for engine ignition system. 4,183,230, Cl. 64-25.000.
Yakame, Ken, to Kabushiki Kaisha Sankyo Seiki Seisakusho. Cassette tape ejecting mechanism. 4,184,185, Cl. 360-137.000.
Yamada, Isao: *See—*
Tsukamoto, Haruo; Koide, Kazuo; Okazaki, Yuzo; and Yamada, Isao, 4,183,146, Cl. 34-13.800.
Yamada, Motohiro. Windmill structure. 4,183,717, Cl. 416-121.000.
Yamada, Tetsuya: *See—*
Ishihara, Toshiaki; Atsumi, Fumitoshi; and Yamada, Tetsuya, 4,183,656, Cl. 355-8.000.

Yamada, Tsuyoshi: *See*—
Ibaragi, Toshio; Satake, Kunio; Yamada, Tsuyoshi; and Hayakawa, Kiyoshi, 4,183,877, Cl. 525-70.000.
Yamada, Yasuyuki; and Kitamoto, Tatsuji, to Fuji Photo Film Co., Ltd. Process of producing a magnetic recording element. 4,183,976, Cl. 427-130.000.
Yamaguchi, Katsuhiko; Suzuki, Yasuhiro; Komima, Makoto; and Shibata, Hiroshi, to Nitto Electric Industrial Co., Ltd. Salts of a basic nitrogenous compound as stabilizers for neutralized polyamide-acid resin. 4,183,835, Cl. 260-29.2TN.
Yamaguchi, Osamu: *See*—
Mukai, Sadayoshi; Otani, Yoshiaki; and Yamaguchi, Osamu, 4,184,190, Cl. 361-315.000.
Yamaji, Tadao: *See*—
Miyamoto, Hiroshi; Yamaji, Tadao; Nakajima, Toshi; and Sagara, Takao, 4,183,561, Cl. 285-321.000.
Yamamoto, Hisao: *See*—
Yamamoto, Michihiro; Koshiba, Masao; and Yamamoto, Hisao, 4,183,932, Cl. 424-251.000.
Yamamoto, Hitoshi: *See*—
Nishikawa, Masao; and Yamamoto, Hitoshi, 4,183,509, Cl. 267-8.00R.
Yamamoto, Katsuro, deceased (by Yamamoto, Michiko, legal representative), to Bridgestone Liquefied Gas Co. Ltd. Cryogenic liquefied gas tank. 4,183,221, Cl. 62-45.000.
Yamamoto, Michihiro; Koshiba, Masao; and Yamamoto, Hisao, to Sumitomo Chemical Company, Limited. Fused quinazolinones and preparation thereof. 4,183,932, Cl. 424-251.000.
Yamamoto, Michiko, legal representative: *See*—
Yamamoto, Katsuro, deceased, 4,183,221, Cl. 62-45.000.
Yamamoto, Takao: *See*—
Shibata, Shin-ichi; Sato, Yasuji; Sano, Yoshikazu; and Yamamoto, Takao, 4,184,054, Cl. 179-99.00M.
Yamanaka, Akira: *See*—
Imura, Toshinori; and Yamanaka, Akira, 4,183,643, Cl. 354-25.000.
Yamanaka, Minoru: *See*—
Ueda, Tatehito; Yamanaka, Minoru; and Ito, Shoji, 4,183,372, Cl. 137-81.000.
Yamaoka, Takahiro: *See*—
Sudo, Kyosuke; Hasunuma, Hisao; Yamaoka, Takahiro; and Sagae, Shigeru, 4,183,592, Cl. 308-187.200.
Yamashita, Tadashi: *See*—
Umahashi, Minoru; Yamazaki, Hideo; Hasebe, Mitsuo; and Yamashita, Tadashi, 4,183,655, Cl. 355-3.0TR.
Yamazaki, Eiichi: *See*—
Ueyama, Takehiko; Nishizawa, Masahiro; Yamazaki, Eiichi; and Ogura, Iwao, 4,183,637, Cl. 354-1.000.
Yamazaki, Hideo: *See*—
Umahashi, Minoru; Yamazaki, Hideo; Hasebe, Mitsuo; and Yamashita, Tadashi, 4,183,655, Cl. 355-3.0TR.
Yamazaki, Noboru: *See*—
Kawasoko, Yoshiaki; Chiba, Iwane; Yamazaki, Noboru; Chiyonobu, Toshimi; and Shikuma, Masao, 4,183,773, Cl. 148-16.000.
Yanagawa, Nobuyuki, to Ricoh Company, Ltd. Photoconductor sheet clamp apparatus. 4,183,652, Cl. 355-3.0DR.
Yanagi, Hirofumi: *See*—
Ikeno, Hitoshi; Sugita, Mitsuyuki; and Yanagi, Hirofumi, 4,183,126, Cl. 29-25.350.
Yasuda, Nozomi: *See*—
Minowa, Seigi; Tanaka, Toshiro; and Yasuda, Nozomi, 4,183,971, Cl. 426-607.000.
Yates, Paul D., to Hercules Industries, Inc. Seal lock. 4,183,566, Cl. 292-317.000.
Yoshida, Akihiko; and Nishino, Atsushi, to Matsushita Electric Industrial Co., Ltd. Solid electrolyte compacitor using low resistivity metal oxide as cathode collector. 4,184,192, Cl. 361-433.000.
Yoshida, Motomasa: *See*—
Munakata, Daisaburo; and Yoshida, Motomasa, 4,184,115, Cl. 325-25.000.
Yoshida, Tsutomu: *See*—
Iwao, Shuji; Abe, Tetsuya; Yoshida, Tsutomu; and Wada, Akemi, 4,183,917, Cl. 424-70.000.
Yoshiike, Nobuyuki: *See*—
Kondo, Shigeo; Yoshiike, Nobuyuki; and Fukai, Masakazu, 4,183,631, Cl. 350-357.000.
Yoshioka, Mitsuru; Uyeo, Shoichiro; Tsuji, Teruji; Hamashima, Yoshio; Kikkawa, Ikuo; and Nagata, Wataru, to Shionogi & Co., Ltd. Oxazolinoazetidinylbutyric acid derivatives. 4,183,855, Cl. 260-307.00F.
Yoshizawa, Kiyoshi; Nojiro, Kikuo; Mitsutomi, Katsuyoshi; Hashimoto, Hiroshi; Noguchi, Akira; and Tanno, Kazuo, to National Tax Administration Agency; Toho Zinc Co. Ltd.; and Hokuren Federation of Agricultural Cooperative Associations, The. Treatment of waste water rich in nutrients. 4,183,807, Cl. 210-2.000.
Young, Carter R.: *See*—
James, Henry J.; and Young, Carter R., 4,183,404, Cl. 166-133.000.
Young, Jerry W., to Phillips Petroleum Company. Blank feeding apparatus. 4,183,516, Cl. 271-3.100.
Young, Robert G., to Westinghouse Electric Corp. Compact fluorescent lamp having a partitioned envelope. 4,184,101, Cl. 313-485.000.
Young, Robert S.: *See*—
Young, Walter M.; and Young, Robert S., 4,183,164, Cl. 43-42.090.
Young, Walter M.; and Young, Robert S. Fishing lure. 4,183,164, Cl. 43-42.090.
Yuen, Raymond C.; Menezes, Mark A.; and Stopper, Herbert, to Burroughs Corporation. In-situ test and diagnostic circuitry and method for CML chips. 4,183,460, Cl. 235-302.000.
Yuter, Seymour C. Drink service system. 4,184,050, Cl. 179-1.0GA.
Zahavkochav, Pelepa. Sleeping bags. 4,183,111, Cl. 5-343.000.
Zakarian, Armen, to Continental Group, Inc., The. Blow-off ducting and baffling for can washer. 4,183,115, Cl. 15-302.000.
Zalipsky, Jerome J.: *See*—
Diamond, Julius; and Zalipsky, Jerome J., 4,183,956, Cl. 424-322.000.
Zanetta, Hugues: *See*—
Michelet, Jacques; and Zanetta, Hugues, 4,183,508, Cl. 266-242.000.
Zarow, Albert I., to Feed Pelleting, Inc. Energy conserving method and apparatus for pelleting particulate animal feed. 4,183,675, Cl. 366-144.000.
Zaske, Peter: *See*—
Theile, Heinz; Hoffmann, Hermann; Rossmy, Gerd; Koerner, Gotz; and Zaske, Peter, 4,183,820, Cl. 252-342.000.
Zenith Radio Corporation: *See*—
Meyer, Ralph L.; and Sobel, Alan, 4,183,125, Cl. 29-25.150.
Tanaka, Akio, 4,184,121, Cl. 325-464.000.
Zerpner, Dieter: *See*—
Streck, Roland; Zerpner, Dieter; Haag, Horst; and Nordsiek, Karl-Heinz, 4,183,844, Cl. 260-42.150.
Zhitetsky, Leonid S.: *See*—
Fainzilberg, Leonid S.; and Zhitetsky, Leonid S., 4,183,241, Cl. 73-17.00R.
Ziegelmeyer, Harold R. Gluing mechanism for finger slotting machines. 4,183,321, Cl. 118-259.000.
Zimmerman, Gary L.: *See*—
Casciotti, Albert; and Zimmerman, Gary L., 4,183,611, Cl. 339-275.00B.
Zomlefer, Jack: *See*—
Biletch, Harry A.; Route, Rodney; and Zomlefer, Jack, 4,183,878, Cl. 525-86.000.
Zuesse, Lance E. Head-support for use in a reclining seat. 4,183,583, Cl. 297-393.000.
Zwerenz, Dietmar, to Ernst Leitz Wetzlar GmbH. Drawing pencil for use with optical scanning apparatus. 4,184,044, Cl. 178-18.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 15TH DAY OF JANUARY, 1980

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Anderson, Charles H.; and Bloom, Stanley, to RCA Corporation. Guided beam flat display device. Re. 30,195, Cl. 313-422.000.

Bloom, Stanley: *See*—
Anderson, Charles H.; and Bloom, Stanley, Re. 30,195, Cl. 313-422.000.

Bruno, Saverio T.; and Sladek, Norbert J., to Bunker Ramo Corporation. High frequency coaxial cable. Re. 30,194, Cl. 174-28.000.

Bunker Ramo Corporation: *See*—
Bruno, Saverio T.; and Sladek, Norbert J., Re. 30,194, Cl. 174-28.000.

Cummins Engine Company: *See*—
Perr, Julius P., Re. 30,189, Cl. 123-139.0AY.

Faulkner, Duane H.; Sanford, Steven D.; and Stanley, Herbert; M., to Johns-Manville Corporation. Method and apparatus for making glass fibers utilizing an oscillating spinner. Re. 30,192, Cl. 65-6.000.

Johns-Manville Corporation: *See*—
Faulkner, Duane H.; Sanford, Steven D.; and Stanley, Herbert; M., Re. 30,192, Cl. 65-6.000.

Mautz, Frances E. Loading container means. Re. 30,191, Cl. 280-43.230.

O'Shaughnessy, James D. Fire retardant agent. Re. 30,193, Cl. 260-45.70R.

Perr, Julius P., to Cummins Engine Company. Fuel injection system for diesel engines. Re. 30,189, Cl. 123-139.0AY.

Predhome, Wilfred F., Jr. Valve train for internal combustion engine. Re. 30,188, Cl. 123-90.160.

RCA Corporation: *See*—
Anderson, Charles H.; and Bloom, Stanley, Re. 30,195, Cl. 313-422.000.

Sanford, Steven D.: *See*—
Faulkner, Duane H.; Sanford, Steven D.; and Stanley, Herbert; M., Re. 30,192, Cl. 65-6.000.

Shaw, Robert F. Electrically heated surgical cutting instrument. Re. 30,190, Cl. 128-303.100.

Sladek, Norbert J.: *See*—
Bruno, Saverio T.; and Sladek, Norbert J., Re. 30,194, Cl. 174-28.000.

Stanley, Herbert; M.: *See*—
Faulkner, Duane H.; Sanford, Steven D.; and Stanley, Herbert; M., Re. 30,192, Cl. 65-6.000.

LIST OF PLANT PATENTEES

de Ruiter, Gijsbert, to Jackson & Perkins Company. Rose plant. 4,493, 1-15-80, Cl. 8.000.

Duffett, William E.: *See*—
Jessel, Walter H., Jr.; and Duffett, William E., 4,494, Cl. 74.000.

Jackson & Perkins Company: *See*—
de Ruiter, Gijsbert, 4,493, Cl. 8.000.

Jessel, Walter H., Jr.; and Duffett, William E., to Yoder Brothers, Inc. Chrysanthemum plant. 4,494, 1-15-80, Cl. 74.000.

Yoder Brothers, Inc.: *See*—
Jessel, Walter H., Jr.; and Duffett, William E., 4,494, Cl. 74.000.

LIST OF DESIGN PATENTEES

Acricite Company, Inc.: *See*—
Barbaresi, Charlotte, 253,922, Cl. D3-53.000.

American Optical Corporation: *See*—
Johnsen, David W., 253,954, Cl. D16-65.000.

Artcarved Class Rings, Inc.: *See*—
Corbin, Bill, 253,941, Cl. D11-33.000.

B. B. & L. Industries, Inc.: *See*—
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Bales, William T., to Plantables, Inc. Three dimensional topiary figure. 253,943, 1-15-80, Cl. D11-149.000.

Bales, William T., to Plantables, Inc. Three dimensional topiary figure. 253,944, 1-15-80, Cl. D11-149.000.

Barbaresi, Charlotte, to Acricite Company, Inc. Handbag. 253,922, 1-15-80, Cl. D3-53.000.

Barr, Josef J. Multiple diamond ring. 253,942, 1-15-80, Cl. D11-34.000.

Baxter Travenol Laboratories, Inc.: *See*—
Heavner, Paul W., Jr.; and LeMay, William E., 253,920, Cl. D2-374.000.

Bedel, Denis E., to Westinghouse Electric Corp. Elevator floor registration button. 253,940, 1-15-80, Cl. D10-108.000.

Bellini, Mario, to Ing. C. Olivetti & C., S.p.A. Desk-top electronic computer. 253,947, 1-15-80, Cl. D14-45.000.

Berglund, Kent E. G. Hood for washing objects with volatile liquids. 253,963, 1-15-80, Cl. D23-151.000.

Blitog S.A.: *See*—
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Bova, Caesar: *See*—
Bova, Anthony F.; and Bova, Caesar, 253,936, Cl. D10-45.000.

Bridges, Roy G. Container for pills or the like. 253,933, 1-15-80, Cl. D9-18.000.

Brookes, Cyril J. Cover for a water closet tank. 253,959, 1-15-80, Cl. D23-69.000.

Brookes, Cyril J. Cover for a water closet tank. 253,960, 1-15-80, Cl. D23-69.000.

Brookes, Cyril J. Cover for a water closet tank. 253,961, 1-15-80, Cl. D23-69.000.

Brookes, Cyril J. Cover for a water closet tank. 253,962, 1-15-80, Cl. D23-69.000.

Brunson, Roy D. Casket for animal or infant. 253,975, 1-15-80, Cl. D99-6.000.

Buckner, Carrol E. Combined fireplace enclosure and stove. 253,964, 1-15-80, Cl. D23-94.000.

Bullock, Woodrow. Combined alarm fishing rod and holder. 253,958, 1-15-80, Cl. D22-13.000.

Cellini, Vito. Control apparatus for dispensing blood or the like. 253,966, 1-15-80, Cl. D24-8.000.

Chin, Arthur W.: *See*—
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Coleman Company, Inc., The: *See*—
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Conley, James R., to Coleman Company, Inc., The. Combined freezable water bottle and tray. 253,927, 1-15-80, Cl. D7-37.000.

Corbin, Bill, to Artcarved Class Rings, Inc. Ring. 253,941, 1-15-80, Cl. D11-33.000.

Daenen, Robert H. C. M., to Dart Industries Inc. Cover for a container. 253,935, 1-15-80, Cl. D9-254.000.

Dart Industries Inc.: *See*—
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DeVischer, LaQuae C.; and Smyth, William B. Table with central grill. 253,931, 1-15-80, Cl. D7-107.000.

Edlund, George E. Perspective drawing instrument. 253,956, 1-15-80, Cl. D19-35.000.

Edwards, John W., to Modular Radio Corporation. Radio. 253,948, 1-15-80, Cl. D14-71.000.
Ehrentraut-Jones, Klaus, to Ventronic Technic AG. Casing for ventilator or the like. 253,965, 1-15-80, Cl. D23-155.000.
Epperson, Charles N. Holder for butter patties. 253,929, 1-15-80, Cl. D7-84.000.
Fought, Edward W. Automobile console mounting stand. 253,946, 1-15-80, Cl. D12-155.000.
Fowler, Corky. Ski boot. 253,918, 1-15-80, Cl. D2-276.000.
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Heavner, Paul W., Jr.; and LeMay, William E., to Baxter Travenol Laboratories, Inc. Molded glove. 253,920, 1-15-80, Cl. D2-374.000.
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Heavner, Paul W., Jr.; and LeMay, William E., 253,920, Cl. D2-374.000.
McBride, Edward J. Yarn tension device. 253,952, 1-15-80, Cl. D15-78.000.
Mikami, Takashi. Closed circuit television camera for use in displaying graphic material or the like. 253,949, 1-15-80, Cl. D14-78.000.
Miyadai, Montaro. Foot massager. 253,967, 1-15-80, Cl. D24-36.000.
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Nalbandian, A. Eugene, to Tweezer-Lite, Inc. Illuminated tweezers. 253,974, 1-15-80, Cl. D28-55.000.
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Restaurant Technology, Inc.: *See*—
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Rosse, Michel, to Blitog S.A. Electrical hair waving appliance or similar article. 253,973, 1-15-80, Cl. D28-35.000.
Salsbury, Richard R.; Kalowski, Thaddeus J.; and Keyes, Richard M., to Restaurant Technology, Inc. Sundae machine. 253,953, 1-15-80, Cl. D15-111.000.
Sheldon, Gary L., to Garden Maid, Inc. Combined auger and tine unit for a garden tiller. 253,950, 1-15-80, Cl. D15-12.000.
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Sweeny, Henry D. Slipper. 253,919, 1-15-80, Cl. D2-283.000.
Szabo, Bela G.; and Borgese, Domenic J., to B. B. & L. Industries, Inc. Ski carrying handle. 253,921, 1-15-80, Cl. D3-36.000.
Talis, Ernest J. Gem container. 253,934, 1-15-80, Cl. D9-121.000.
Texas Instruments Incorporated: *See*—
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Waters, Bobby L. Portable cleaning system. 253,951, 1-15-80, Cl. D15-34.000.
Westinghouse Electric Corp.: *See*—
Bedel, Denis E., 253,940, Cl. D10-108.000.
Whiteman, Larry R. Comb having a cavity for holding a nail file or the like. 253,969, 1-15-80, Cl. D28-25.000.
Whiteman, Larry R. Comb having a cavity for holding a nail file or the like. 253,970, 1-15-80, Cl. D28-25.000.
Whiteman, Larry R. Comb having a cavity for holding a nail file or the like. 253,971, 1-15-80, Cl. D28-25.000.
Wilkinson, Bette J. Foot ornament. 253,917, 1-15-80, Cl. D2-270.000.
Wolfe, Samuel E. Dowsing rod tip. 253,938, 1-15-80, Cl. D10-46.000.
Yates, Douglas L. Golf club head. 253,957, 1-15-80, Cl. D21-215.000.
Youness, Michael R. Freight retaining panel for a railroad car. 253,945, 1-15-80, Cl. D12-42.000.
Zinkgraf, R. C.; and Painter, David L., to Dart Industries Inc. Skillet. 253,930, 1-15-80, Cl. D7-94.000.

CLASSIFICATION OF PATENTS

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